THE ARCHITECTURAL FORUM

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FOR QUARTER CENTURY THE BRICKBUILDER

COUNTRY HOUSES

From Designs of

Delano & Aldrich

H. Van Buren Magonigle

THE IMPORTANCE OF COLOR AND TEXTURE IN BUILDING MATERIALS

THE PELHAM BAY NAVAL TRAINING STATION

Ewing & Allen, Architects

JULY 1918

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THE ARCHITECTURAL FORUM

VOLUME XXIX NUMBER 1

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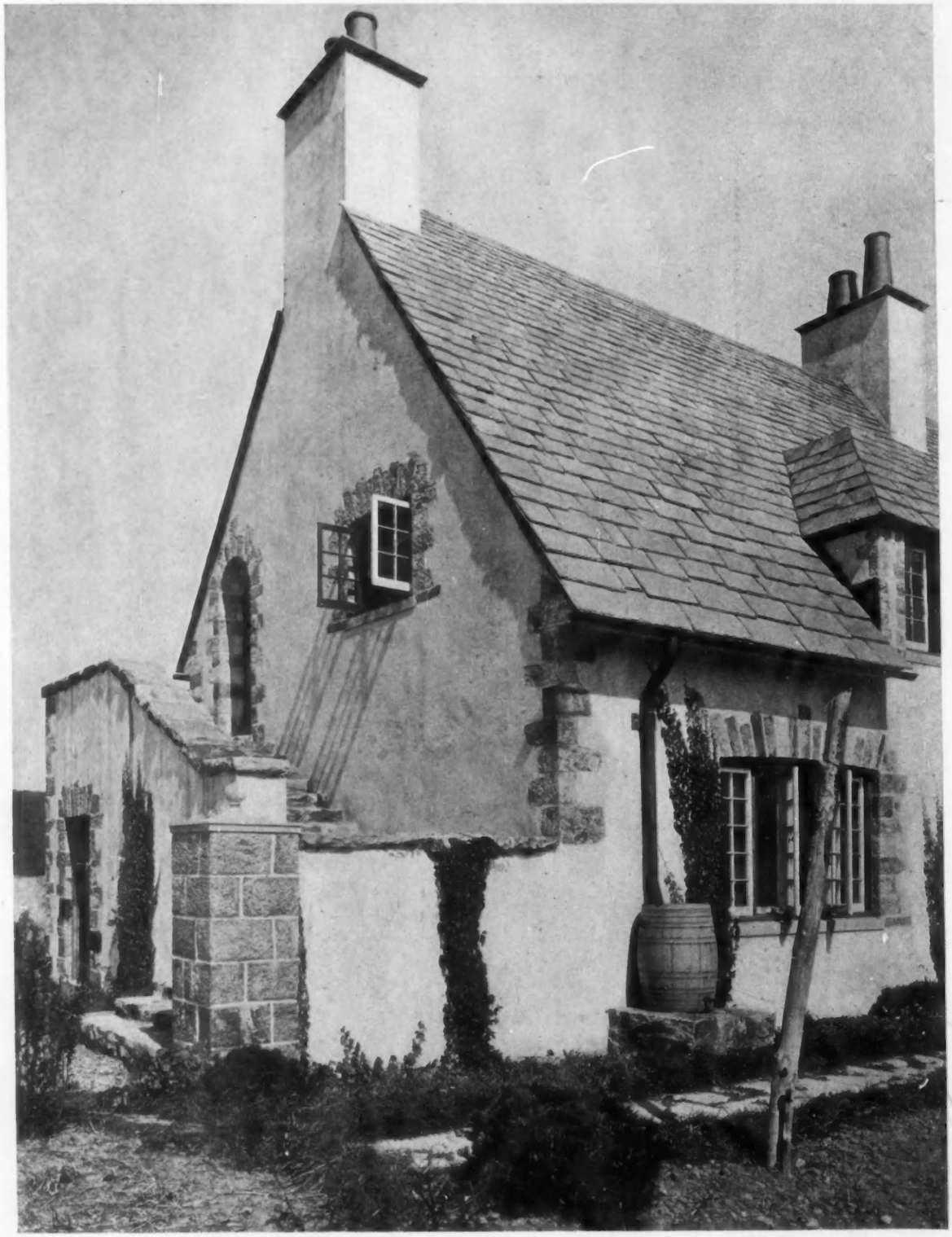


DETAIL FROM A FARM COTTAGE

LEWIS COLT ALBRO, ARCHITECT

See article, "The Importance of Color and Texture in Building Materials"

THE ARCHITECTURAL FORUM

FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXIX JULY 1918 NUMBER 1

The Importance of Color and Texture in Building Materials

PART I

By C. MATLACK PRICE

IN broad consideration of design as taught by the schools, and in studious consideration of design as taught by travel, as well as by the schools, a disproportionately small amount of attention has been paid to certain properties of building materials.

For the purpose of simplifying the main theme of these notes, they will be confined to the field of domestic architecture, and will be directed primarily toward the development of a practical appreciation of the values of *texture* in building materials, and of the significance of certain materials as *units of design*.

There has been a marked tendency, especially on the part of lay critics, to compare the expressive values commonly attained by English country-house architects with the absence of expressive values often apparent in the work of our own country-house architects. Those who would excuse the latter have hastened to bring forward the contention that the English architect is more fortunate in that he has at hand a greater variety of interesting local materials, such as slates, tiles, and native stones. Those who would condemn the American architect lay the matter squarely at his own door, affirming that the English architect enjoys no greater possibilities in the choice of interesting and picturesque materials.

There is so much truth in both contentions that the case must be restated, impartially. It is true that England has long been rich in expressive building materials, but it is also true that recent years have seen the development, in this country, of varied and excellent manufactured materials. It is true that the first of these two facts has conspicuously aided the English architect; but it is also true that our own architects, until recent years, have largely failed to avail themselves of such materials as were actually obtainable.

By way of throwing into clear relief the great importance of texture and identity in building materials, it is illuminating to recall for a moment the practices (well within the span of memory) which were designed to contradict and even quite to obliterate the textures and identities of materials.

Of these practices we recall most readily the one-time popularity of the ideal of uniformity in brickwork. It was called uniformity, but its real name was monotony. Real names, however, were no more respected or esteemed in those days than real textures or real materials. Bricks were made of absolutely uniform color and smoothness, and were laid up with corresponding uniformity. There were no incidents or surprises, and a brick house was as uninteresting as a plain clapboard house and less architectural than the modern factory building. Brickwork was painted; wood and cast iron were "sanded" to masquerade as stone. All three lost their proper identities and received in return a fictitious guise which held no natural or honest meaning. Cheap interior woods were "grained" to imitate (whether well or ill) expensive interior woods.

The offenses of the period were not only against superficial appearance and fundamental ethics, but against common sense; and taste, certainly, was at its lowest ebb along the sands of architecture.

A better day for brickbuilding was, perhaps, the first to dawn, and the reversion to older and more honest ideals is attributed to Stanford White. We will take brick, then, as the first material for discussion, observing in sequence the current developments in the architectural possibilities of slates, tiles, fireproof blocks, stucco, native stone and wood.

The dawn of the era of better brickbuilding came with the observation of some of the oldest buildings at Harvard University in Cambridge. In the days when those buildings were erected, brick was not to be had so easily that the masons could throw out all that were "imperfect," including those with burnt ends which had been in contact with the fires as they were stacked for firing. These ends were discolored in a range of beautiful natural shades, from black through blues, dark and light, purples, and deep olive greens. Imperfect machinery added a desirable element of character to each individual brick, and a wall laid up with burnt ends appearing here and there at random was rich in values of color and texture.

At a later time, when the manufacture of brick became a flourishing industry, and the material was to be had in unlimited quantity, the ideal of monotony came into favor, and discolored bricks were thrown out entirely as unfit for use, or used only

An excellent example of interest in texture obtained by frank use of ordinary materials — common brick, cement casts, troweled stucco

Frederick Sterner, Architect

for foundation work below grade, drains, and filling. The face-brick was carefully selected with a view to achieving perfect and unbroken monotony.

With the discovery at Harvard, however, began a better time, and the rejected burnt bricks soon came to be demanded in specifications and used as incidents, either for random introduction or for contriving simple patterns by regular recurrence in bonding. It was seen at once that the whole idea of a brick wall is that it is built of bricks. It was also seen that diversity, not monotony in brickwork, must be the true ideal of the brickbuilder, and that a single brick might, conceivably, be more interesting than a whole wall. In other words, there came into being the now familiar idea of *texture* in bricks and brickwork.

A natural division appears between the texture of the individual brick and the texture of the entire wall: the first being the province of the manufacturer; the second the province of the architect and the mason. When manufacturers realized that the demand for burnt-end bricks was more than a passing fad, it was not long before they began making special bricks, baked in a fine variety of æsthetic colors and cast in an equally fine variety of interesting textures. With these there could be no further excuse for uninteresting and inexpressive brickbuilding, for a wall might now be rich in all the colors of an old Oriental rug, and laid up in any sort of pattern, whether simple or intricate in its character.

Coincidentally with the rediscovery of texture in brick came the rediscovery of texture in brickwork. Once attention came to be focused upon the fact that a brick must rightly be considered as a unit of design, the manner in which bricks were laid up became expressive of this identity as a unit. The raked joint became popular, because its shadow threw each brick into relief, and effected, as well, an honest and agreeable texture for the whole wall.

It is doubtful, now, if even a serious decline in architectural taste and sanity could place brickbuilding back again at its one-time dead level of stupidity and dishonesty. *Texture*, it is safe to say, has come to be regarded as an essential property of both brick and brickwork, and one finds on every hand examples of technique as expressive, as idiomatic, as full of interest as any which could be cited in the realm of recent English domestic architecture.

Like brickwork, the old idea of a slate roof showed a distressingly stupid and unintelligent neglect of the inherent possibilities of the material. Colored slates were used, it is true, but were used in patterns as stupid and as inexpressive as oilcloth, and the monotone slate roof, like brickwork, was kept to an absolute uniformity of size and color in the slates, so that the slate as a unit could not assert itself.

Excellent possibilities, however, have arisen with the slates which are called "graduated," and which offer a fine range of natural color in addition to their variations in size. The colors are in low tones of gray, purple, and gray-blue, and the largest slates are used at the eaves, graduating in size to the smallest at the ridge. The edges are rough and irregular, so that a roof of graduated slate has a natural texture and an expressive degree of ruggedness which have added distinct character to a number of recent buildings.

It is not that a new material has been devised, but that we have given back to an old material some of its natural properties, and have allowed it to aid architectural design by frankly expressing these qualities.

The building of slate walls has not been at all common in this country, as it has been in certain parts of England, though many examples have been seen in which slatelike stone, with natural cleavage, has been split up to lay in thin courses. A slate wall naturally possesses peculiar values in texture and color; but unless the material be plentiful in the immediate locality, the quantity required for any considerable building project would render its use impractical.

In the matter of roofing tiles we have still a great and unrealized field. We have long had "Spanish" and "Italian" tiles, which have been an obvious aid to the architects of the Pacific Coast, but for the most part these have been too uniform and too machine

made. Their insistent regularity made it very difficult to achieve soft and irregular roof lines: they suffered from being too well made.

Shingle tiles have but recently been available, and in variegated size and color in this roofing material lie excellent possibilities for the imaginative manufacturer. The best values in texture will come from using tiles which most closely approximate the old hand-made tiles, whose irregularity was their greatest charm. An advantage of this form of tile lies in its lightness, not necessitating the support of a very heavily framed roof.

As in the case of brick, a marked variety in coloring, as produced by accidentally uneven firing, or by firings of carefully regulated difference, will be far better than a monotonous uniformity of color. Since we know that tiles, from their nature, are separate pieces of burnt clay, like bricks, why in the name of art and architecture should they be so mechanically and unimaginatively baked as to produce a roof which looks as though it had been fired all in one piece? It would do nearly as well to use stamped metal, paint it red, and call it a tile roof.

A recent development in roofing materials is seen in the variegated asbestos-composition shingles, which possess an advantage for the small house in that they do not require such heavy roof-framing as tiles or slates. The manufacturers have shown a clear appreciation of the demands of modern design in making these shingles with rough and uneven edges, and in an interestingly varied range of colors.

Floor tiles have been more appreciated and are coming to be used with greater facility and freedom in living rooms and dining rooms — not only the familiar and ever pleasing red quarry tiles, but tiles of more unusual and diverse textures and colors.

It was some time before tiles found other uses than for terraces and sun-parlors, and, after making themselves popular in hallways, were discovered to be a splendid flooring material for the living room and dining room. The color possibilities, the durability and the sanitary advantages of tiles for floors recommend them for increasingly varied uses in domestic architecture.

Above all, tiles make an *interesting* floor, which often combines with the general character of an interior to achieve a thoroughly successful solution of the floor problem.

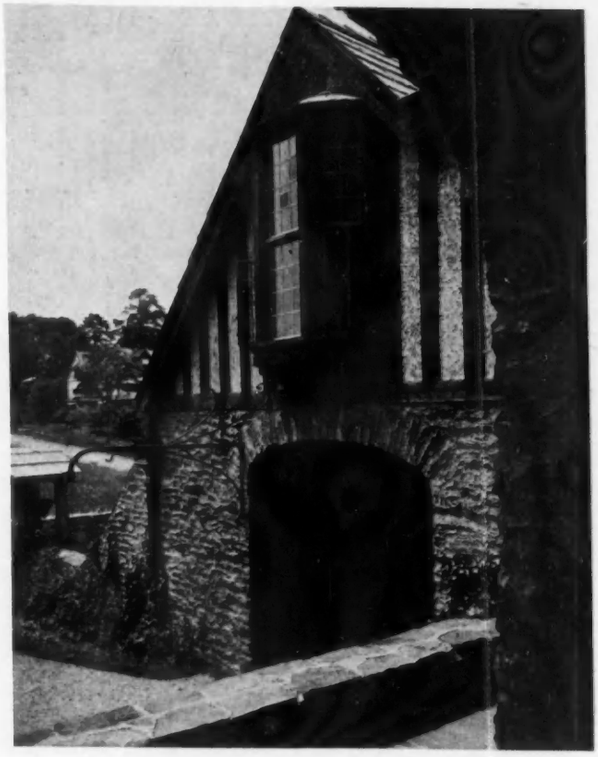
Decorative tiles, too, have engaged the attention of manufacturers and have added much to the possibilities of design, especially as incidents in brickwork or stucco. The quaint, irregular type of decorative tile with modeled surface has been revived in many forms and in great variety, and if intelligently used as "seasoning" or accent, may achieve thoroughly admirable results.

Good texture in slate and brickwork of a cottage
Lewis Colt Albro, Architect

One of the most interesting prominent examples of design in decorative tilework is to be seen in the loggia of the annex of the Pan-American Union Building, Washington, D. C. (Albert Kelsey and Paul P. Crét, Architects), and again in the flooring of the patio of the main building.

In nowise differently from brick or roof-tile, decorative tiles may be made æsthetically valueless by too insistent regularity. If all are geometrically identical, hard and uncompromising in shape, uniform in pattern, color, and texture, no interesting results will reward their use. It was this fault which made the English "Stoke-upon-Trent" tiles so greatly favored in Eastlake's time, the abominably uninteresting and banal thing they were. Pattern, color, texture, shape — all identical. Given one stupid-looking tile, a row of six repeated (often built into wooden houses) was six times as stupid, and the more profusely they were used, the more hopeless the result, the more like a piece of oilcloth.

A manufactured building product which has recently been developed to an interesting extent is the fireproof block, which, if cast and fired with due thought to texture and color, may well come to occupy an important place. Besides its recommendable fireproof qualities, the large size of the units represent an economy of mason labor. From the point of view of design the chief problem of the fireproof block will be found in designing in scale, especially where the small house or cottage is concerned.



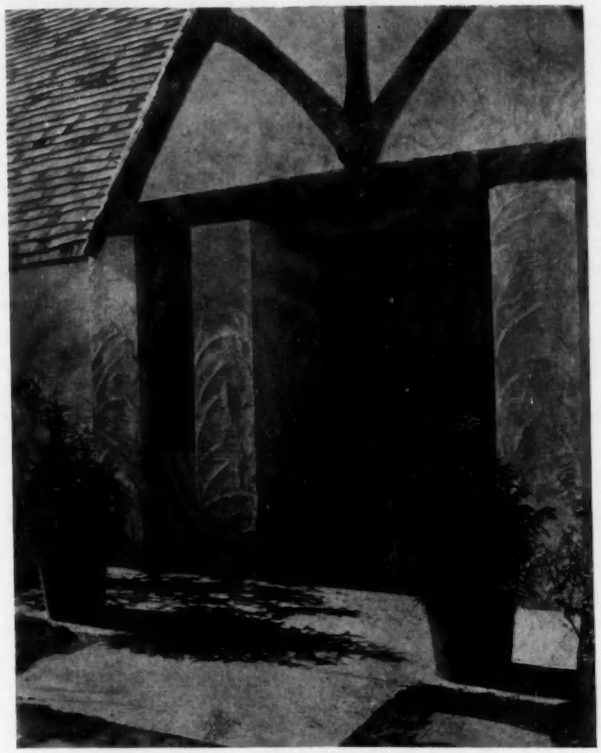
Example of texture in wood, stonework, and stucco
Henry Morse, Architect

Interesting variety in textures and colors of stone, brick, and tile
James A. Greene, Architect

Textures in concrete blocks have been so largely confined to the deplorable "rock-face" imitation that it is difficult to see beyond, or to visualize some happier and more æsthetic possibilities, though the field is one in which manufacturers might do well to enlist the cooperation of architects.

Due to restrictions of available labor and materials in England, we read that English architects are conducting extensive experiments in the design and production of concrete units, and similar conditions in this country might awaken our manufacturers to some undreamed of possibilities in the development of concrete building blocks.

The present shortcoming is due largely to a lack of appreciation of the æsthetic and architectural importance of textures, shapes, and colors, and also to adherence to an absolutely inartistic "sameness." If concrete blocks were made in graduated sizes, for "random" courses and in a range of subdued colors, it would be possible to effect many interesting and



Textures of stucco and timber work allowed excellent freedom
Bloodgood Tuttle, Architect

stone as a building material. This has been most noticeable in the vicinity of Philadelphia, where the local " ledge stone " of Chestnut Hill has found a variety of excellently colloquial uses.

These, for the most part, have followed in the footsteps of the early Colonial dwellings of the locality, which held the natural charm inherent where sophistication and sham have not yet crept in.

The early builders employed stone because it was ready to hand, and allowed it to look like stone because they had no conceivable impulse to make it resemble anything else. They were not, in other words, ashamed of the humble, honest material they chose, and this material, as a result, repaid their frank acceptance by imparting to those early buildings a charm and fitness and fundamental architectural merit which forms the most conspicuous factor of success in the modern revivals of the type.

All localities are not so fortunate in the possession of a suitable and practical building stone, and in such cases the use of some other and more locally appropriate and logical material is usually dictated by observation of the oldest existing buildings, erected before the days of rail transportation, where local materials were used of necessity rather than because of any æsthetic theory.

The possibilities of texture in wood are of relatively recent discovery, especially in the matter of expressive uses. Texture, too, should be developed, and should avoid exaggerated imitation of stone, since the day of architectural imitations has, for the most part, passed.

Stucco, because of its application to large surfaces, comes under considerations which are different from those applying to building materials which are relatively units, and the question of texture is even more important. The diversity given by jointing, as well as by the natural or artificial range of colors in bricks, slates, and the like, are wanting, and the interest may be effected only through the manner in which the stucco is applied, and the skill and ingenuity with which it has been colored.

The task here is squarely up to the architect and the artisan — and it might be said to both that possibilities in both texture and color have been but little developed in this country, although a few excellent examples which have been seen afford ample proof that neither opportunity nor ability is lacking.

In the use of native stone there is apparent an increasing tendency to make the most of the natural properties of

Interesting colors and textures in slate, stonework, and exterior woodwork
Bellows & Aldrich, Architects

exterior woodwork. Natural grains and figures have for some time been given their proper importance in interior trim, where transparent stains have largely superseded obliterating paints, and where the texture of the wood has been dictated, to some extent, the manner in which it is detailed. Texture in exterior woodwork may owe its rediscovery to the numerous recent examples of true half-timber houses which have been built. In the study of ancient half-timber work the architect must have observed that much of the character and virility of the old examples lay in the ruggedness of the timbering. Here was something very different from smoothly milled lumber, and something essential in the obtaining of a complete result which would adequately approximate the model.

The old timbers were roughly hewn, with clearly defined marks of the adze, interesting irregularities, absence of geometrical precision. The wood seemed to be a living material with character and vitality and expression, almost as though still growing, or as though the forms in which it was carpentered were themselves organic things, far removed from the ænemic, lifeless creations of "paper architecture."

Early half-timber work is a relic of the days when men *built* houses of rough and ready materials instead of *drawing* houses and thinking (if at all) in terms of inexpressive materials. This quality in old work was not due to any greater architectural ability, but rather to a lesser architectural ability and less self-consciousness. And with this lesser degree of self-consciousness there was inevitably as a result, a willingness to allow natural textures of building materials to assert themselves.

This, after all, is the essence of the whole matter. Materials must be shaped for practical use, or manufactured; but beyond their shaping or manufacture the most successful and admirable architectural results, where relatively informal projects are concerned, will come from allowing the natural textures and colors of materials to assert themselves frankly and unequivocally, providing interest greater than any labored surface decoration affords.

In the second of these two papers on texture in building materials the writer will present the views and theories of several country-house architects whose work has consistently indicated a practical appreciation of the importance of color and texture.

Excellent texture in roof and wall surfaces in a variety of materials — shingles, stone, stucco, and half-timber work
Albro & Lindeberg, Architects

THE FORUM COLLECTION OF MODERN GOTHIC ARCHITECTURAL DETAILS

PLATE SIX

THIS pulpit shows the customary polygonal plan, but is noticeably different from the orthodox form by the absence of the single supporting stem, thereby giving a greater sense of stability and security than the more common "wineglass" type enjoys. Carrying the polygonal plan to the floor does not effect in any adverse way the delicacy or grace of the design, and in reality the quality of verticality adds greatly to its simple beauty.

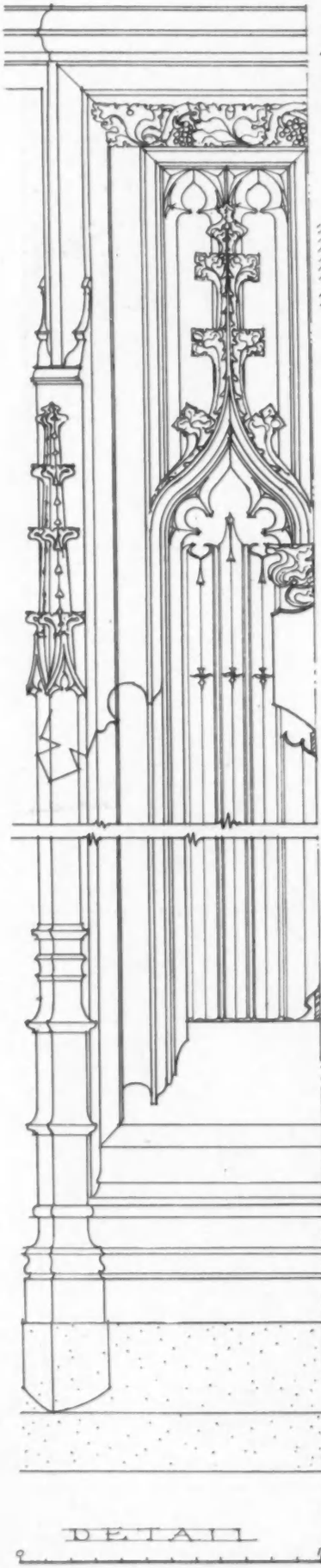
PULPIT IN CHURCH OF THE EPIPHANY, SHERWOOD, WEST PHILADELPHIA, PA.

DAY & KLAUDER AND E. E. HENDRICKSON, ASSOCIATED ARCHITECTS

DETAIL DRAWING BY ROBERT A. TAYLOR ON FOLLOWING PAGE

Details of the Pulpit
Church of The Epiphany Sherwood
West Philadelphia Pennsylvania

DAY AND KLAUDER E E HENDRICKSON
ASSOCIATED ARCHTS PHILADA PENNA
DRAWN BY ROBERT A TAYLOR



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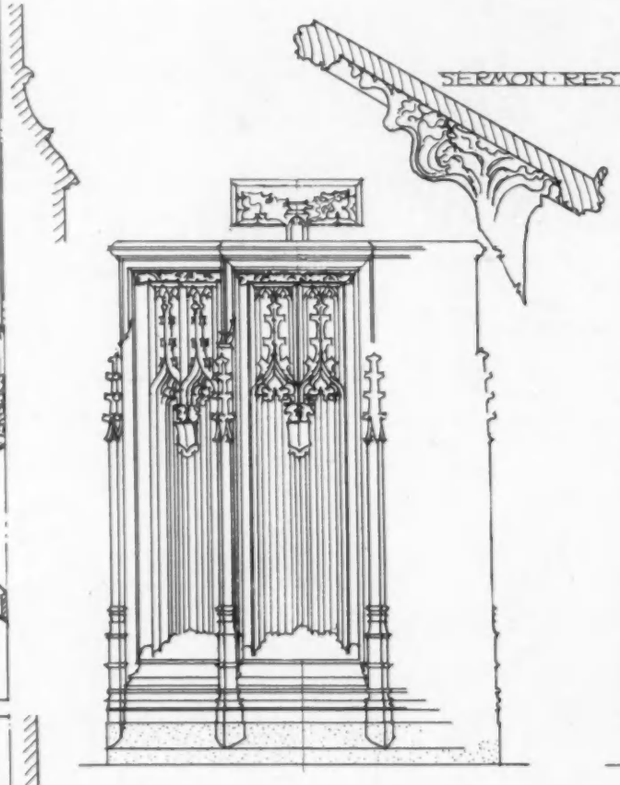

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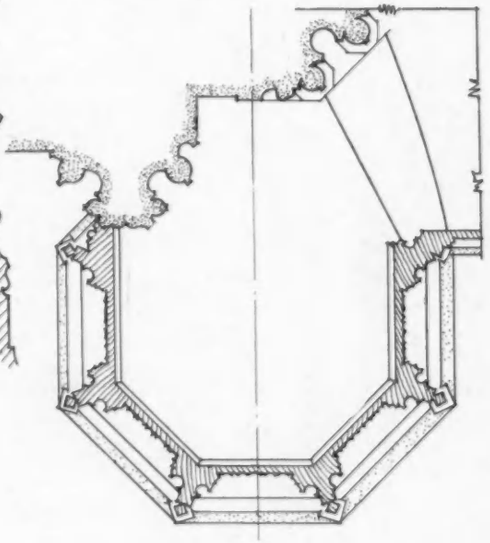

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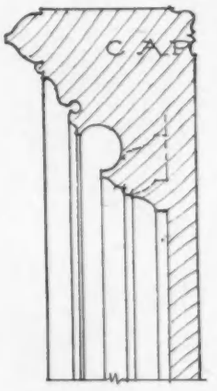

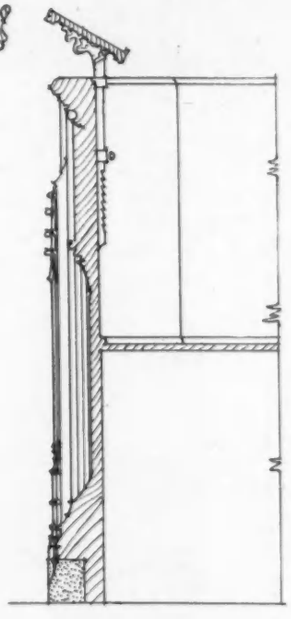

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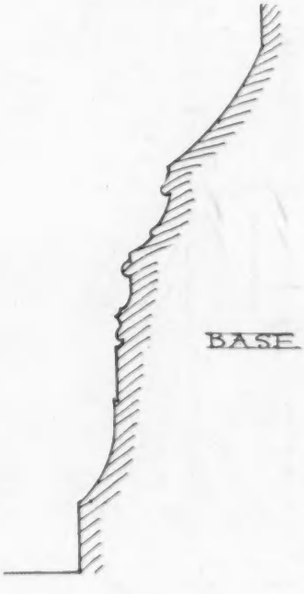

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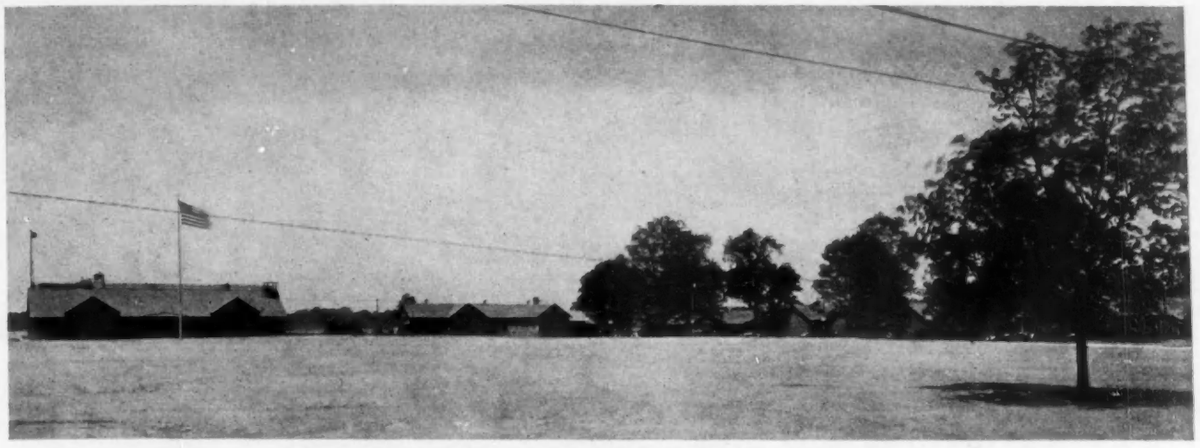


General View Looking Across Parade Ground to Administration Building

The Pelham Bay Naval Reserve Training Station

EWING & ALLEN, ARCHITECTS

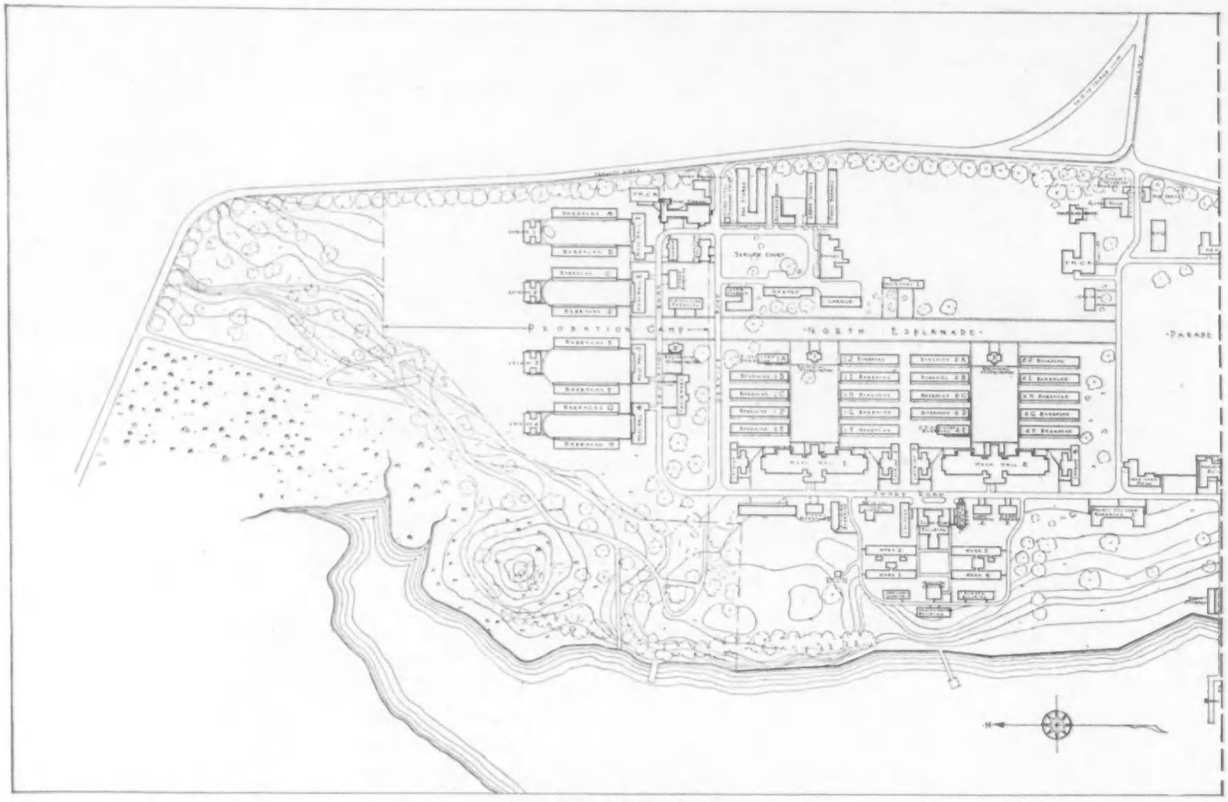
THE Naval Reserve Training Station at Pelham Bay Park, New York, is perhaps one of the most interesting of the many military and naval camps established by our Government in various parts of the country for the training of recruits. It is fortunate in its location, being on a sheltered bay of Long Island Sound, a short distance from New York City. The land which it occupies is a part of the park system of New York and possesses many natural advantages, chief among which are a very fine growth of old trees and a gently rolling topography, affording fine views of water and countryside.

The camp is considered from the viewpoints of operation, administration, and layout to be particularly well fitted to its task, and this is in great measure due to the foresight of the naval authorities in entrusting its design and erection to a firm of architects who were able to effect the layout of the camp in an architectural manner, bringing to the work their accumulated experience in planning, which is so essential to a proper grasp of the fundamental principles underlying any problem, if a successful scheme is to be evolved. The plan of the camp is the work of Messrs. Ewing & Allen of New York, and it is singularly significant in pointing out the value of trained professional advice architects are able to render in problems of this character. To study this camp and see its well coordinated relation of parts, resulting in perfect administration, is to wish that more of our camps were based on equally well thought out schemes. The Army cantonments are, of course, much larger and were required in a shorter space of time than those for the Navy. While it is true architectural advice was sought and utilized in their planning, it was confined chiefly to details of barracks, etc., and the larger problem, — the fitting of the various units to the land, the location of roads, and those other features of fundamental importance were determined by the cantonment division of the military establishment and carried out under the direction of constructing quartermasters at the several locations.

Aside from certain groupings of related parts of the military and naval organizations, which are only a unit of the whole, the planning of a training camp is purely an architectural problem. It calls into play the same principles underlying any plan, whether it be that of a university campus, a hospital, public building, or whatever one calls to mind, in that it is a logical distribution of parts, so corelated and adjusted to one another that circulation among them is easily effected and the whole functions in an orderly manner. This may theoretically be possible in a strictly military layout ; but when this scheme is transferred to actual ground having varied topography, a difficult problem is presented in adapting it to special conditions. The old military way was to reduce everything to a level plane and then locate the needed structures in orderly, straight lines. But how uninspiring and deadly monotonous is such a scheme, to forget for the moment the consideration of expense in carrying it out !

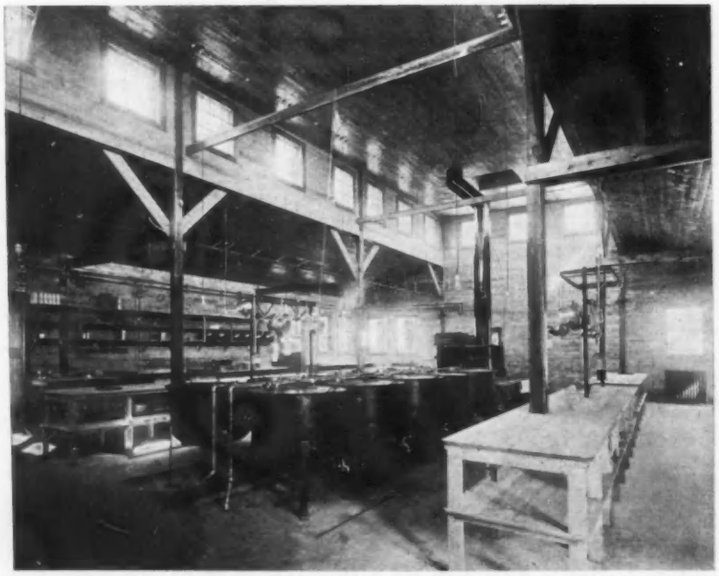
How much better and more satisfactory in every way was the planning of the Pelham Bay Camp executed. Here an attractive piece of countryside was selected, well covered with old trees, which under the terms of acquisition were not to be cut down or destroyed, and the problem of designing a camp to fit the site and accommodate 5,000 men was given the architects for a satisfactory solution.

We see in the plan as developed a well unified scheme of extremely simple parts. It divides logically into three divisions, each of which has a dis-



Plan of North Half of Camp

tinctly separate function and is a self contained unit. At the north end of the plot is the probation camp, in which the new recruits spend the first twenty-one days of their training under observation of the medical staff; the center part of the plot is occupied by the main camp, consisting of two regimental units at either side of the parade ground and administration building; the third group comprises the hospital buildings, located near the shore and away from the centers of activity. The entrance to the camp is from a main highway on the east opposite the administration quarters. This gives immediate access to the large parade ground and permits spectators to observe the drilling without interfering with the routine life of the camp. Leading north and south from the parade ground are broad concrete esplanades to the barracks, affording simple and easy means of quickly assembling the entire camp for drill. At the west end of the parade ground is the administration building, the center of the camp's life.



Interior of Kitchen in Regimental Mess Halls

One outstanding feature of the plan which contributes in the largest measure to the successful operation of the camp is the layout of roadways so that the training of the men is at no time interfered with by the operations of the service department, which it must be realized is a large factor in the maintenance of 5,000 men. This has been effected by the service road, which swings through the entire camp connecting up the vital points, extending from the coal dock at the southeasterly end, past the rear of each of the mess halls, latrines, and the hos-

Plan of South Half of Camp

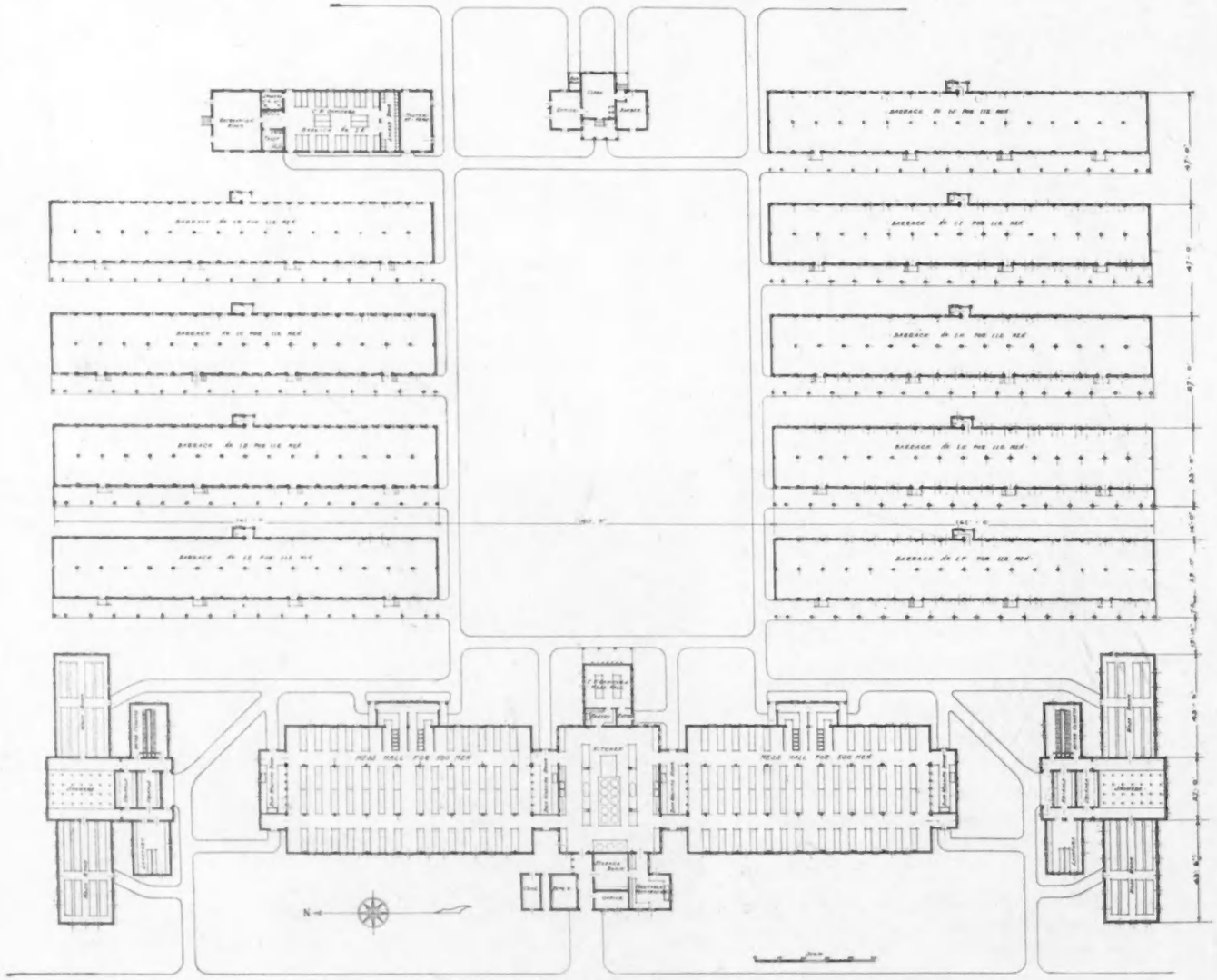
pital group, and emerging on the main highway at the right of the probation camp. All the training activities are disposed to the east of this roadway and between its side arms, so that there is never any crossing of supply wagons or other service traffic over the training field or the main esplanades.

Subsidiary groups are the commissary department and general service court located at the service entrance and serving both probation and main camps; the social activities group, embracing buildings of the Y. M. C. A., the K. of C., and the canteen at the main entrance, and a third group made up of the power house, black gang and detention camp or "brig" at the southern end of the plot.

The same general care for orderly functioning extends to the arrangements of the individual groups and buildings as to the whole scheme. Thus each regiment is housed in a group of buildings, making it at the same time an independent unit as shown in the typical plan reproduced herewith, and an integral part of the larger scheme. Each regiment contains 1,000 men, accommodated in barracks for 112 men each, arranged at opposite sides of an open space 140 feet wide and 210 feet long. At the end of this space, which provides a regimental training field and facing toward the esplanade, is the headquarters building and at the opposite end the mess hall, adjacent to each end of which is a latrine for each row of barracks. The barracks are 161 feet long and 25 feet wide with entrances on the west side, sheltered by an overhang of 7 feet, and are

Interior of Typical Barracks for 112 Men

General View of Typical Regimental Unit Looking Toward Mess Hall



Plan of Typical Regimental Unit, Naval Reserve Training Station, Pelham Bay, N. Y.
Ewing & Allen, Architects

spaced 14 feet from rear wall to line of posts supporting the overhang, which affords space for the assembling of each company preparatory to regimental formation in the larger open space. The chief petty officers are housed in their own barracks in connection with each regiment and are provided with a recreation room and locker space.

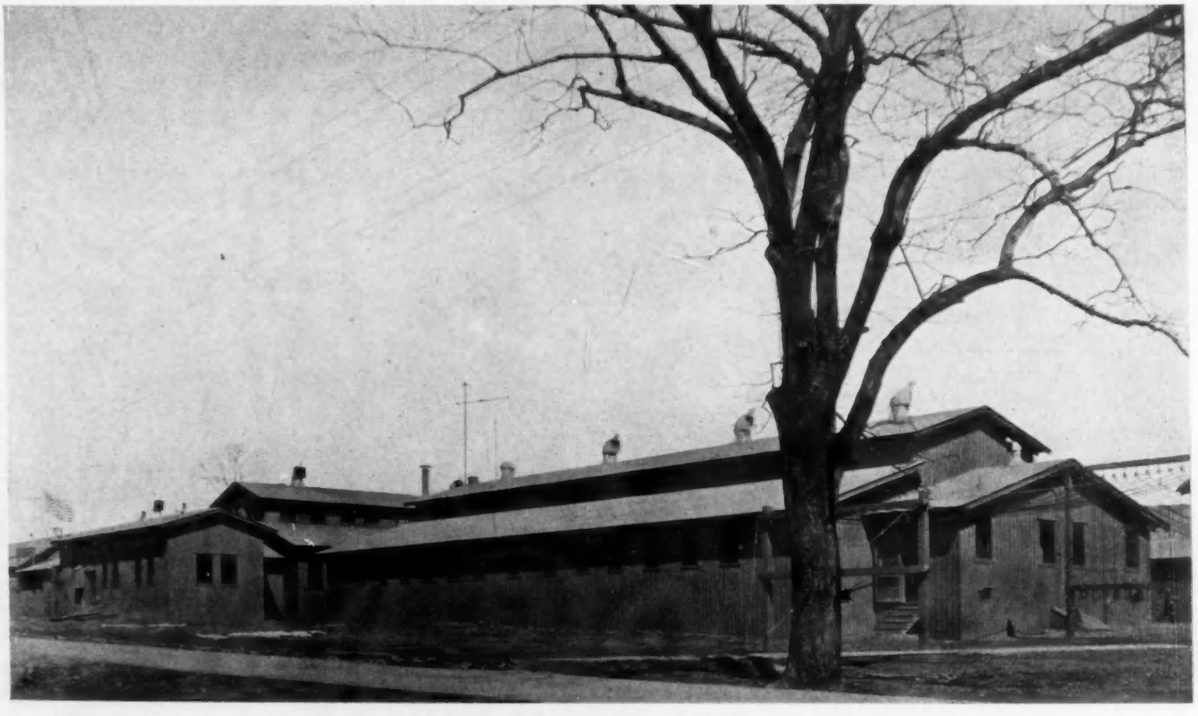
The mess hall is arranged in two sections with the kitchen or "galley," as the Navy terms it, between the wings. The service is conducted on the cafeteria principle, and the building is especially planned for its efficient operation. The men march to meals in company formation and enter in two lines through doors in the center of the east side of the mess. Here they secure bowls and plates from a counter and file past the steam tables from which the food is served to them, and then take their places at tables on which knives, forks, and spoons have previously been placed. The exits are at opposite ends of the hall and in passing out the men deposit their dishes at the counters of the dish-washing rooms located between the exits. With this scheme of operation no confusion exists, and the 500 men which each hall accommodates can be served in a remarkably short space of time.

An interesting side light on the thoroughness of discipline and the virtue of neatness as practised in every quarter of the Navy is seen in the upkeep of these mess halls. After each meal the table tops are scrubbed white, the floor is washed, and all utensils, caldrons, steam tables, etc., are scoured and polished, this work of course being done by enlisted men assigned to that duty.

The kitchen is equipped with the most modern cooking appliances, and has in close proximity separate storage, vegetable preparation, and refrigerator rooms. The menus are prepared for an entire week in advance and show a remarkably wide range of food. On occasions a special meal is required of no mean order or proportions, and though it requires extra effort on the part of the sailor cooks, they are always found equal to the task. The barracks for the cooks are across the service road, separated from those of their regiment, for the cooks' hours of duty vary from the usual naval work making it desirable to house them separately.

The chief petty officers are served at tables in a separate small mess hall near the kitchen and facing the regimental drill ground. The commissioned officers are served in the officers' mess next the administration building, to the other side of which are the officers' sleeping quarters.

There are two latrines for each regiment, each serving one line of barracks. In these buildings, which are also remarkable for their cleanliness and orderly arrangement, each of the various functions are given separate compartments. The men are not permitted to shave or otherwise make their toilets in the barracks, the latrines being designated for this purpose, and accordingly they must be well equipped to meet the needs of a large body of men using them during short periods of time. The showers are in



Exterior of Typical Regimental Mess Hall from Service Road

View Along Probation Road in Probation Camp

the center with clothes washing rooms at either side, and grouped about the entrance are the toilet facilities. The clothes washing rooms exhibit another phase of the sailor's life that is of special interest. Each man is required to wash his own garments and this is done in true naval fashion with cold water, quantities of soap, and a scrubbing brush. Running lengthwise of the room are two gutters in the cement floor and above them, raised about 2 feet, are two lines of pipe with faucets at regular intervals. On either side of these gutters are low, movable platforms made of plank and supported on cleats. The men kneel on the floor, wetting the clothes to be washed under the faucets and then spread them out on the platforms to scrub with brushes and soap, after which they are rinsed, laced to the lines in sailor fashion, and hoisted to dry at the rear of the building.

The probation camp is composed of units similar to the main camp, but of smaller size because of the fewer men to be housed. The barracks are linked up in pairs with a latrine and mess hall at the ends. This section has its own Y. M. C. A. building, canteen, and infirmary, so that it is in every way independent of the larger camp. It is here the enlisted men are received, and the process with which they are inducted into the service indicates the degree of importance that should be attached to the planning of camp buildings. The recruits are received in the building marked "clothing storage" on the plan at the entrance to the probation camp. They successively pass through the barber shop, disrobing room, from which their civilian clothes are packaged to be sent home, the shower room, the medical examiner's quarters, where finger print and other identification marks are recorded, the uniform assignment room and the dental room, after which they are assigned to their barracks. This work is expeditiously carried on in a building especially planned for it.

The hospital group is located on the shore side on land sloping toward the bay, so that it is removed from the activities of the camp, insuring the necessary quietness and isolation. The arrangement of the buildings is shown in the group plan reproduced herewith. They are connected with one another by covered passages arranged in easy slopes to take up the irregularities of the land. The group accommodates approximately 160 patients in open wards and individual rooms. The operating pavilion, at the easterly end, is an exception to the general interior finish in having painted plaster walls for hygienic reasons. A large window sloping in affords ample north light. The ward buildings are 72 feet long and finished inside with wallboard except for the toilet rooms which are sheathed. The floors of the toilet rooms and operating pavilion are of cement and those of the wards, wood. Each ward is provided with a diet kitchen, a room for the preparation of dressings, and a nurses' room. Windows in the hospital group are of the double hung type, except in the laundry,

Typical Battalion Unit in Probation Camp

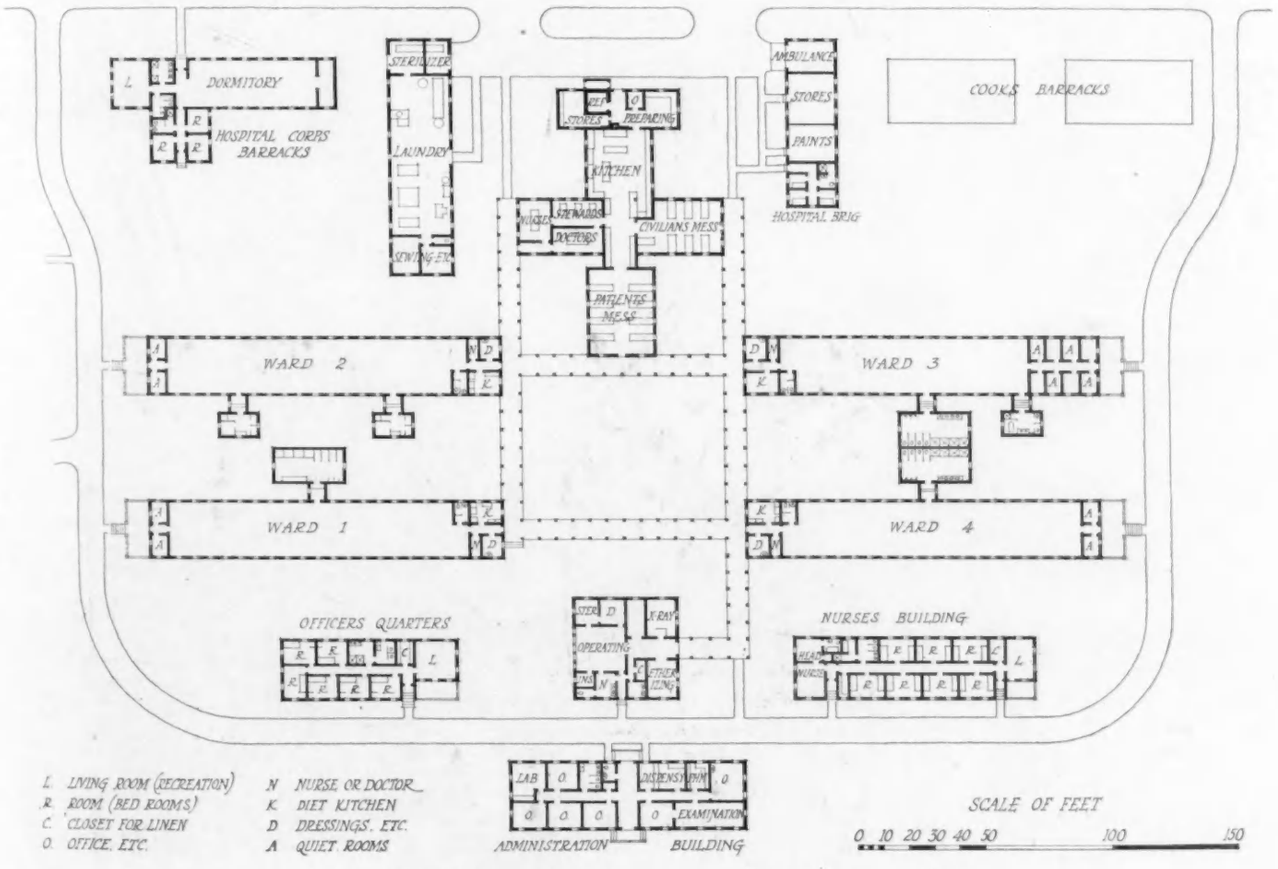
case and on the outside in the other. This type of and from them, hammocks are swung at night to simi-

where they are hinged at the bottom to swing in, and interior doors are of a stock, five-panel pattern.

The construction of all the buildings is of good frame type, the walls of 2 by 4 inch studding sheathed inside and out, the outer surface having a layer of building paper covered with vertical siding, the joints being covered with vertical battens. The roofs are pitched with pleasing proportions and covered with a three-ply prepared roofing of a soft gray color. The buildings are supported on 6 by 6 inch posts with the floors raised about 2 feet above grade. Some of the interiors, such as the rooms of the administration building, officers' barracks, nurses' quarters, etc., are finished in wallboard arranged in panels and painted. All the buildings not so treated are carefully sheathed and finished with one coat of varnish. The floors of the mess halls and latrines are cement, and others generally of two thicknesses of wood. The officers' lounge in the administration building is of special attractiveness in a simple decorative scheme of buff and deep blue. The walls and ceiling are of wallboard, paneled and painted buff. Windows are arranged in effective groups, and blue hangings, comfortable furniture, and large, deep buff shades on the suspended lighting fixtures contribute a clublike atmosphere.

A detailed description of the enlisted men's barracks will indicate the method of construction and finish employed generally throughout the buildings. They are framed with center posts 6 by 6 inches, spaced 8 feet on centers. A cross tie of 4 by 6 inches occurs over each post at the level of the wall plate, and 2 by 6 inch struts distribute the roof load to the top of each post. The rafters are 2 by 6 inch timbers, spaced 20 inches on centers with a pitch of 8 in 12. The interior walls are sheathed, and the roof space is similarly ceiled at a point about one-third up the slope. The floor joists are 2 by 8 inches with a span of 12 feet 6 inches and spaced 16 inches on centers, on which is laid a double wooden floor. The floor level is raised 2 feet 10 inches above the grade, and clean-out doors are provided at intervals for access to the space beneath the floor from the outside.

The windows are placed with their heads just under the wall plate and are of a double casement sash type with transom bar between, the upper sash swinging out from the bottom and the lower sash swinging in from the top. All the windows are screened, the screens being placed on the inside of the sash in one



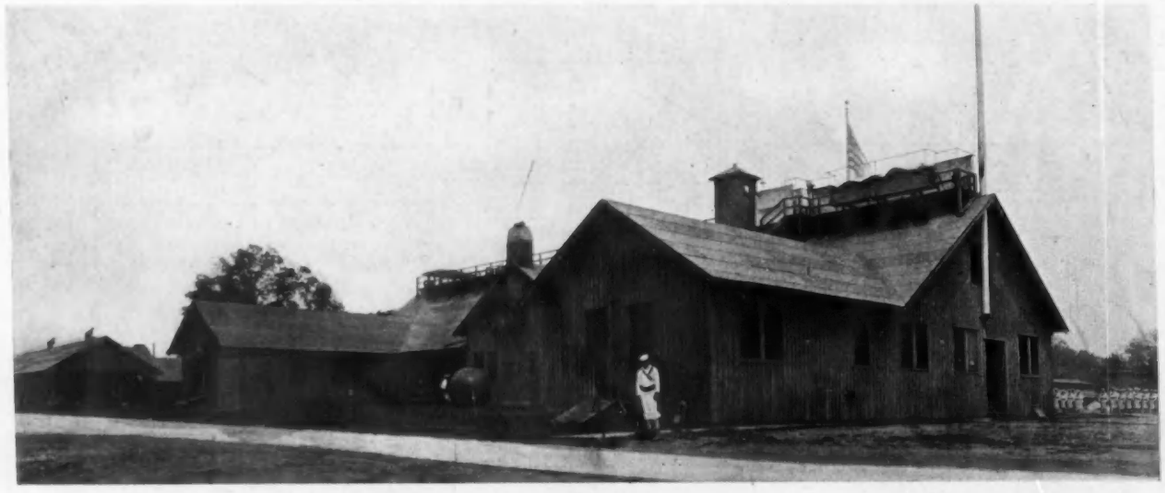
Plan of Hospital Group, Naval Reserve Training Station, Pelham Bay, N. Y.

case and on the outside in the other. This type of window is used in all barracks and is efficient from the standpoint of ventilation, as two currents of air are possible of passing through it in opposite directions at the same time.

The barracks as well as all other buildings in the camp are heated by steam supplied from the central power plant. The heating is connected up with the ventilating system in a simple manner that has proved most effective. The radiators are raised from the floors and rest on a box about 6 inches high, in the top of which is an opening supplied with fresh air conducted through a duct from the outside wall. In most of the buildings the radiators are placed against the outside walls, so that the connection between the radiator and air supply is most direct. In the barracks, however, to insure even distribution of heat with the minimum of radiating surface, the radiators are placed in the center of the floor space, one to each bay, thereby requiring an air duct for each radiator of half the width of the building. In the ceiling to the right and left of each radiator there are vents opening to the space under the roof through which the exhausted air is drawn out of the building by revolving suction ventilators at the ridge line.

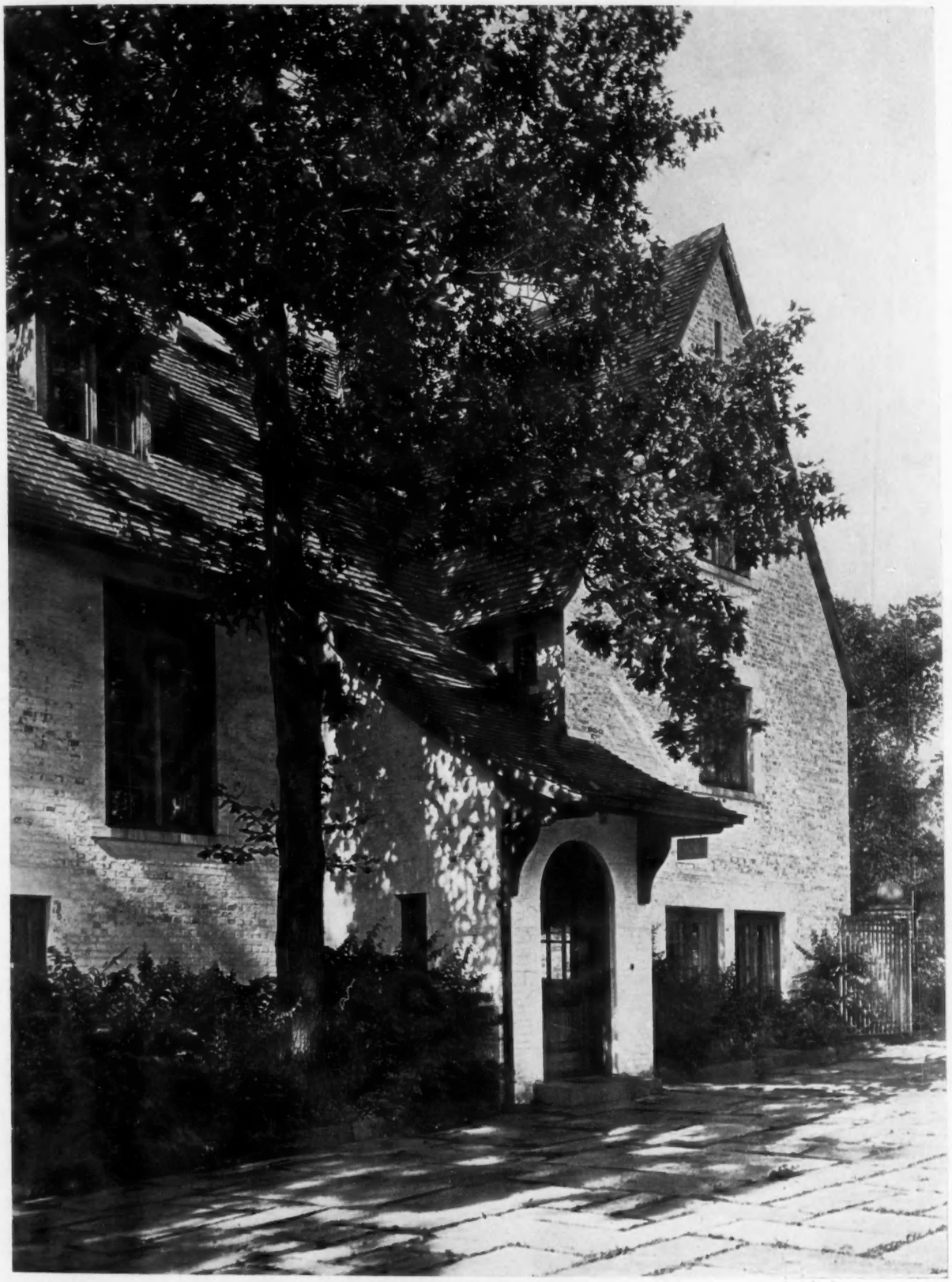
The men sleep in hammocks which in the daytime are folded up and stored in a wooden box provided for each man's outfit and placed against the outside wall at his station. Wrought pipes of 3 inch diameter are placed between the posts at a height of 6 feet, and from them, hammocks are swung at night to similar pipes attached at a corresponding height to each of the opposite walls. This arrangement allows two rows of hammocks running the length of the barracks.

The Pelham Bay Camp has unquestionably proved in its operation the value of its architectural treatment. The benefits are not confined to increased efficiency in operation, but extend as well to the morale of the men in training. There is an undeniable psychological influence in the nicely proportioned, low-lying structures and in the general color scheme of gray green painted walls and soft gray roof surfaces. The view looking across the parade ground to the administration building presents a picture of such inspiration as cannot help arousing the best qualities of the men who witness it every day. The gray green barracks stretching to the right and left, the trees standing out in groups among them, the blue of the sky, the long gray roof lines — all compose a foil of harmonious tones for the central dominating note of color — the national emblem flying from its white staff. Everything is of a positive order, there is no dull monotony to cause depression, and it is no undue exaggeration to attribute as much to this fortunate circumstance as to the rigid sanitary regulations of the Navy, the very small percentage of men confined to "sick bay," there being but 11 out of a total 5,000 men at the time of the writer's visit to the camp in the early part of June.



View of Administration Building from Service Road

Ewing & Allen, Architects

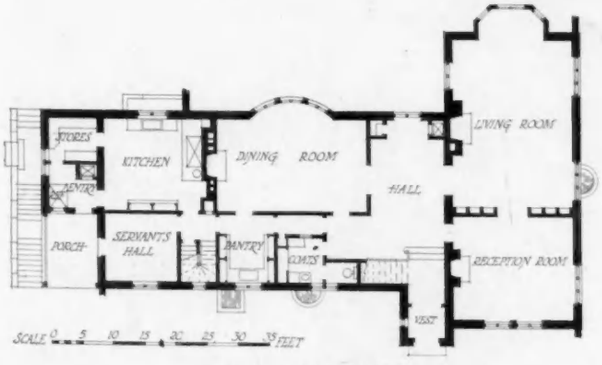


DETAIL FROM ENTRANCE FORECOURT

HOUSE OF MISS E. R. HOOKER, NEW HAVEN, CONN.

DELANO & ALDRICH, ARCHITECTS

GENERAL VIEW FROM STREET

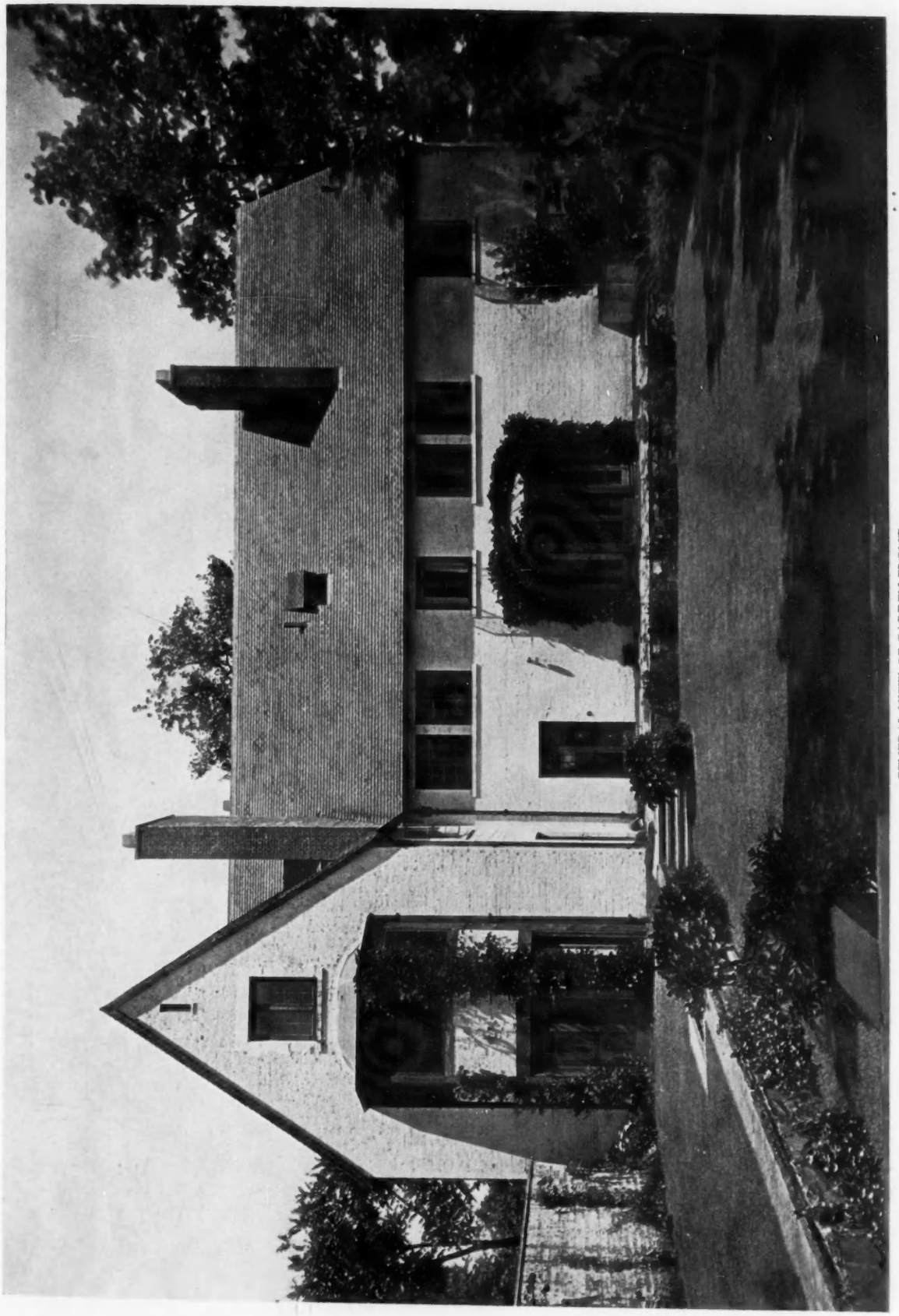


FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF MISS E. R. HOOKER, NEW HAVEN, CONN.

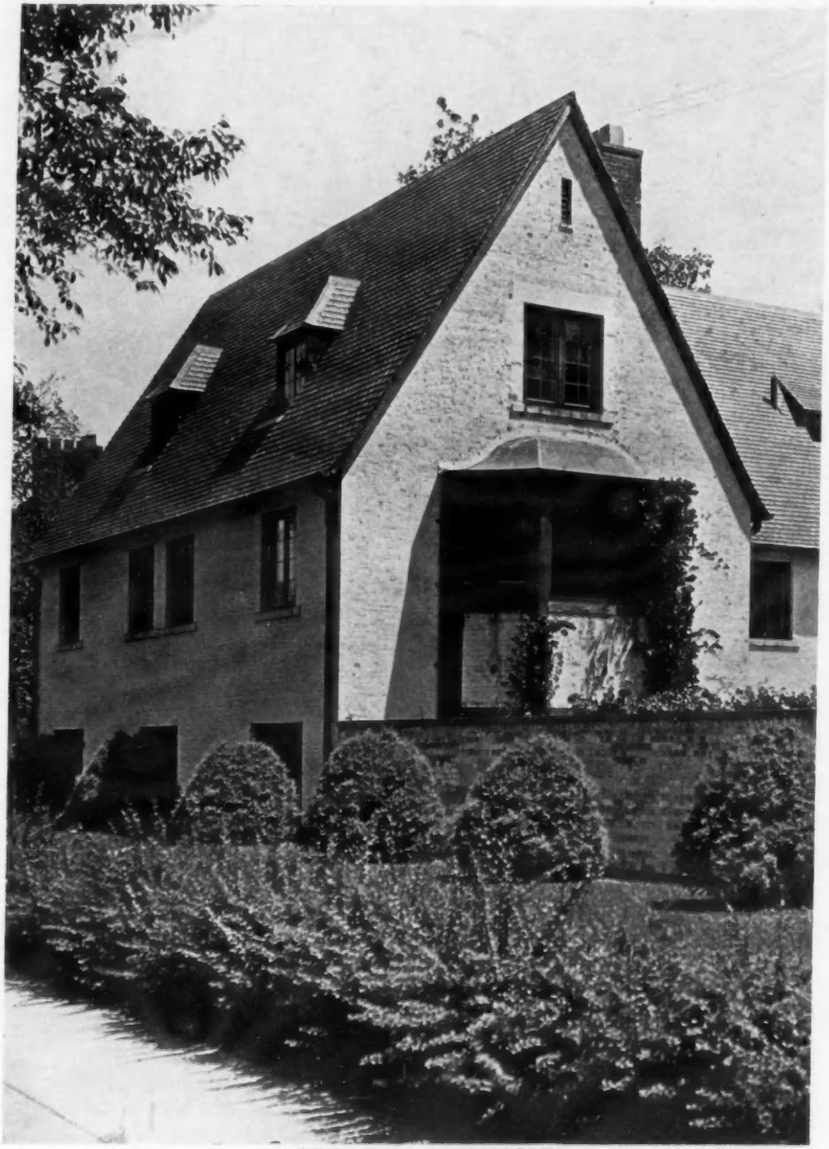
DELANO & ALDRICH, ARCHITECTS



GENERAL VIEW OF GARDEN FRONT

HOUSE OF MISS E. R. HOOKER, NEW HAVEN, CONN.

DELANO & ALDRICH, ARCHITECTS

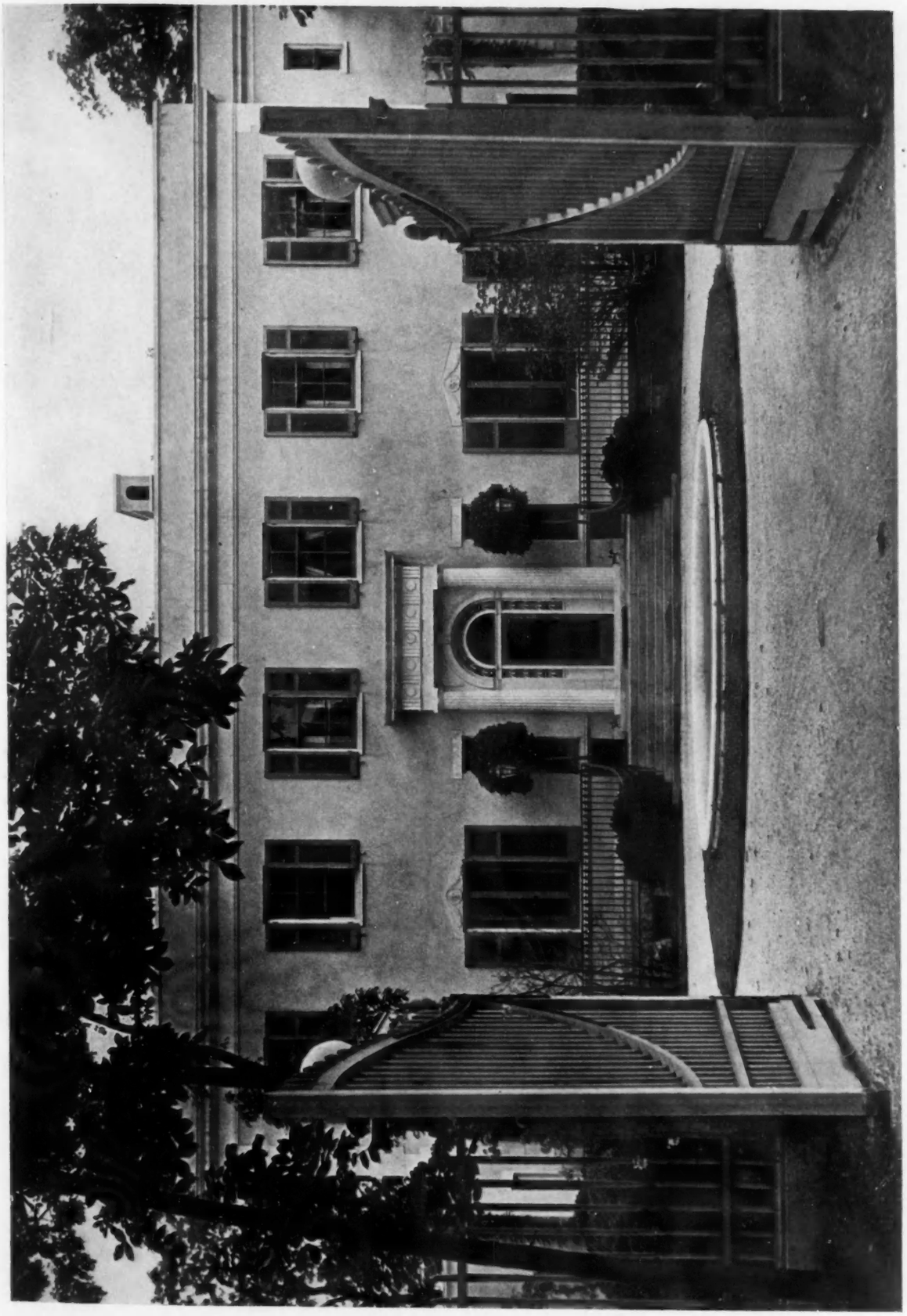


DETAIL OF LIVING ROOM BAY

DETAIL OF GABLE ON ENTRANCE SIDE

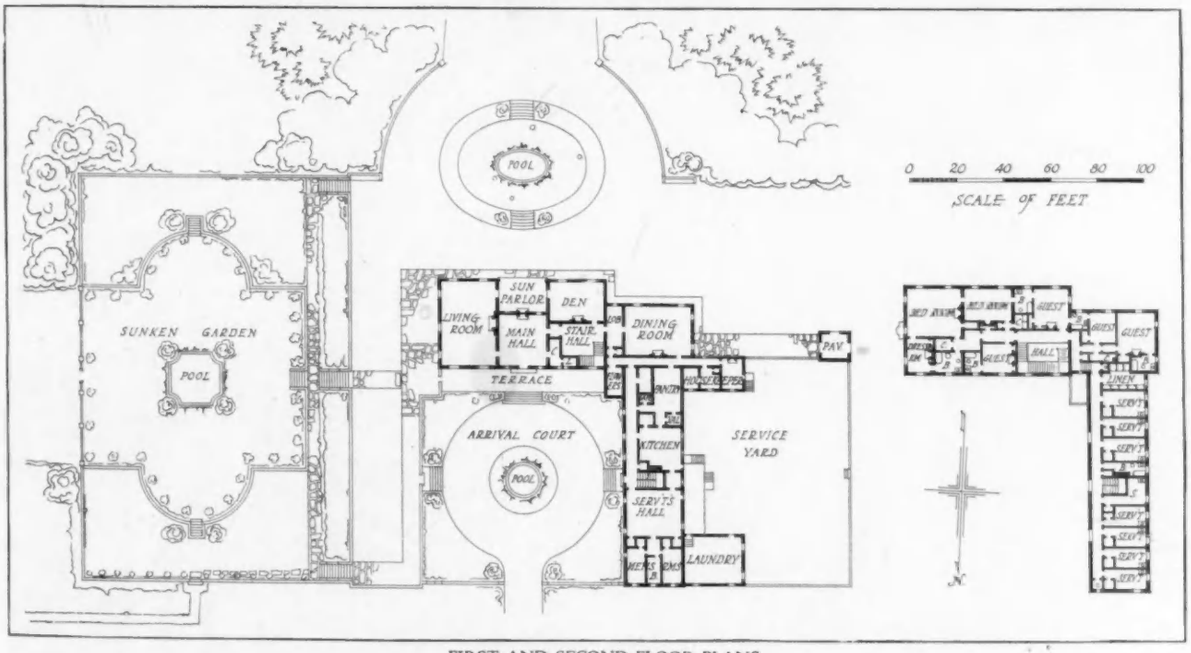
HOUSE OF MISS E. R. HOOKER, NEW HAVEN, CONN.

DELANO & ALDRICH, ARCHITECTS



HOUSE OF VICTOR MORAWETZ, ESQ., WOODBURY, LONG ISLAND, N. Y.
DELANO & ALDRICH, ARCHITECTS.

VIEW FROM THE GARDEN



FIRST AND SECOND FLOOR PLANS

HOUSE OF VICTOR MORAWETZ, ESQ., WOODBURY, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

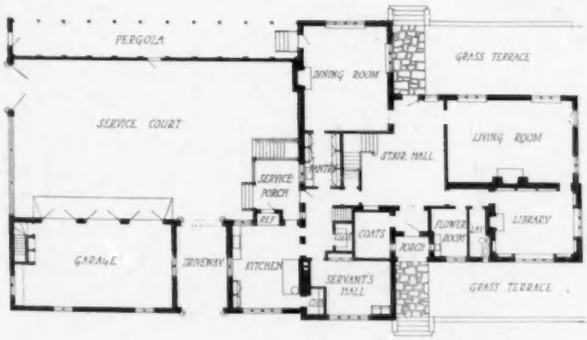
VIEW FROM THE SUNKEN GARDEN

ENTRANCE TO GARDEN FROM ARRIVAL COURT

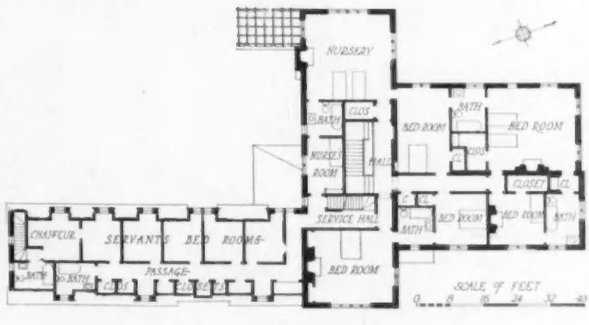
HOUSE OF VICTOR MORAWETZ, ESQ., WOODBURY, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

VIEW OF ENTRANCE SIDE



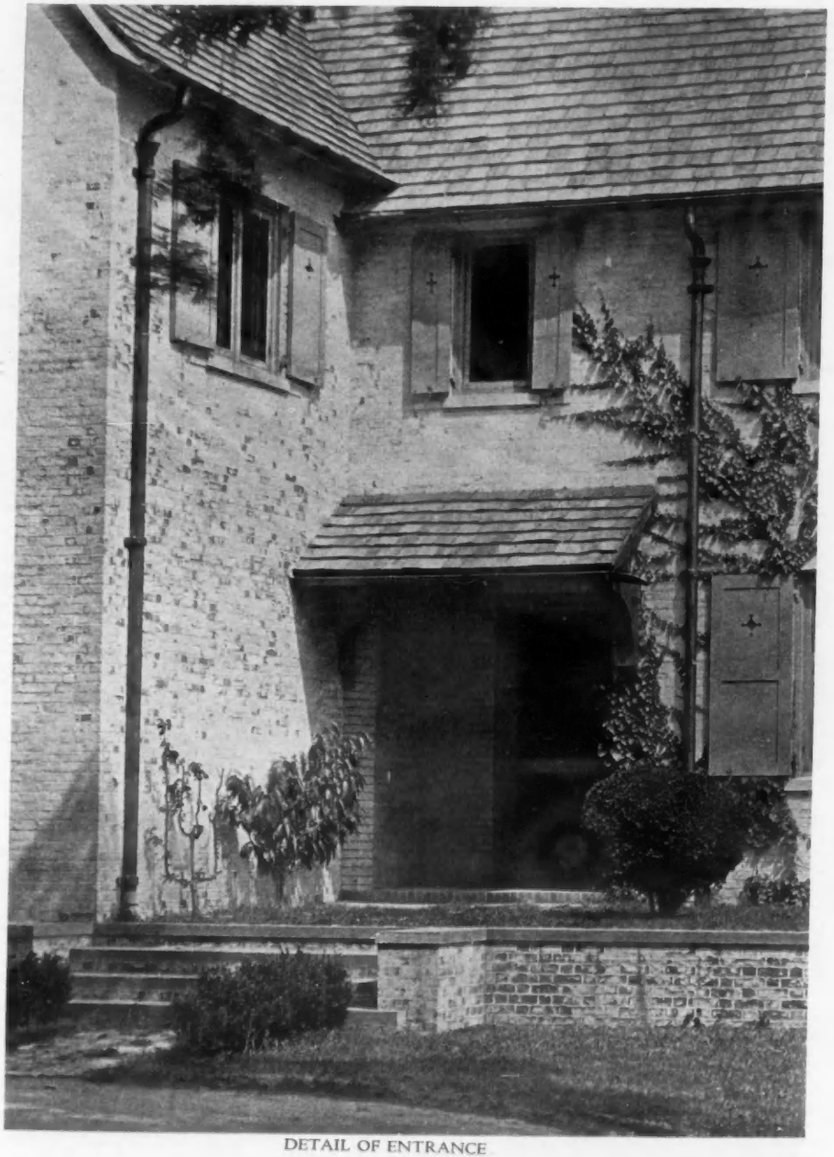
FIRST FLOOR PLAN



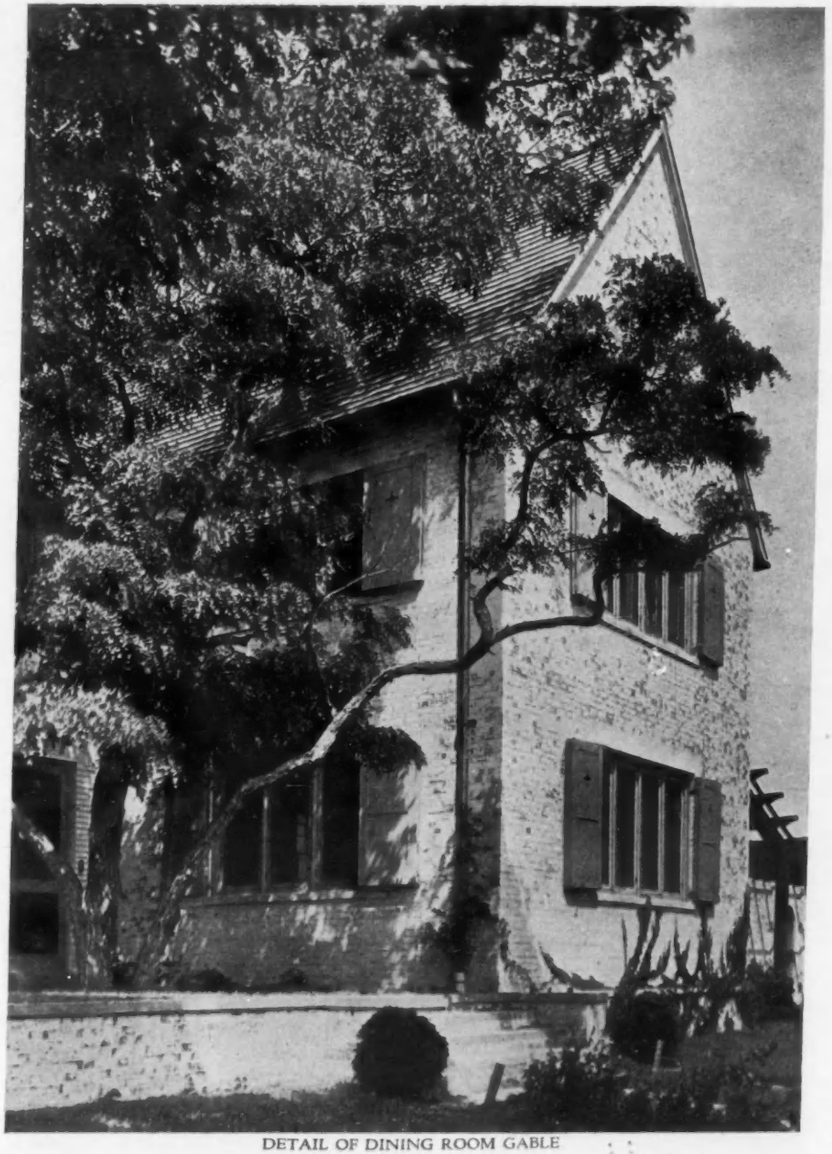
SECOND FLOOR PLAN

HOUSE OF MALCOLM McBURNEY, ESQ., EAST ISLIP, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS



DETAIL OF ENTRANCE



DETAIL OF DINING ROOM GABLE

HOUSE OF MALCOLM McBURNEY, ESQ., EAST ISLIP, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

VIEW FROM THE WEST

FIRST FLOOR STAIR HALL

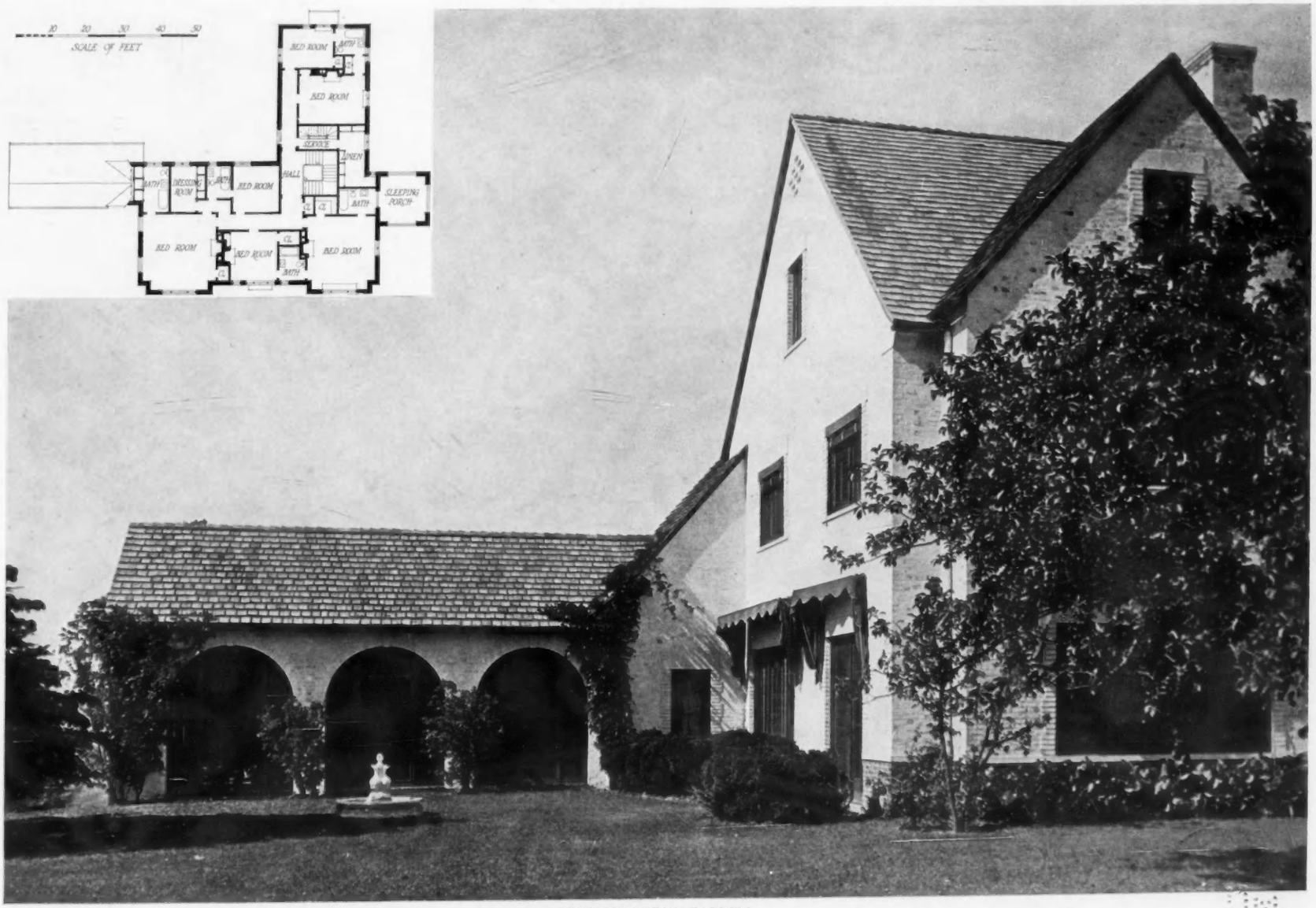
HOUSE OF MALCOLM McBURNEY, ESQ., EAST ISLIP, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

GENERAL VIEW FROM THE FORECOURT

HOUSE OF GEORGE WHITNEY, ESQ., WESTBURY, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS



VIEW FROM THE GARDEN

HOUSE OF GEORGE WHITNEY, ESQ., WESTBURY, LONG ISLAND, N. Y.

DELANO & ALDRICH, ARCHITECTS

DETAIL OF TEA HOUSE

HOUSE OF GEORGE WHITNEY, ESQ., WESTBURY, LONG ISLAND, N. Y.

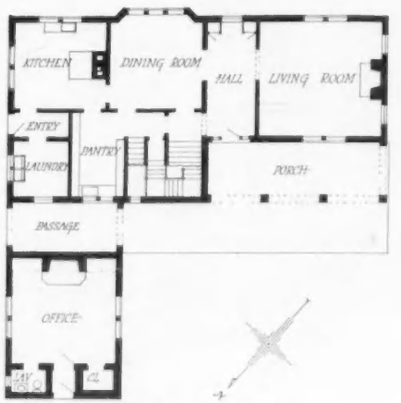
DELANO & ALDRICH, ARCHITECTS

SUPERINTENDENT'S COTTAGE, ESTATE OF FRANKLIN MURPHY, ESQ., MENDHAM, N. J

H. VAN BUREN MAGONIGLE, ARCHITECT

DETAIL OF ENTRANCE COURT

VIEW OF SOUTHEAST SIDE



FIRST FLOOR PLAN

SECOND FLOOR PLAN

SUPERINTENDENT'S COTTAGE, ESTATE OF FRANKLIN MURPHY, ESQ., MENDHAM, N. J.

H. VAN BUREN MAGONIGLE, ARCHITECT

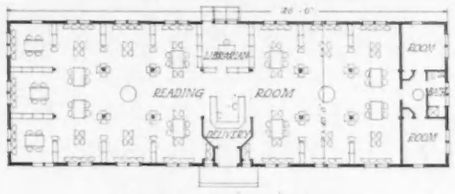
TEA HOUSE, ESTATE OF FRANKLIN MURPHY, ESQ., MENDHAM, N. J.
H. VAN BUREN MAGONIGLE, ARCHITECT

The Army Libraries and Liberty Theaters

By ALFRED MORTON GITHENS

IN the camps and cantonments the War Department confines itself to housing, clothing and feeding the men, and to their military training. For this it constructs quarters and barracks, mess-halls and kitchens, headquarters, quartermaster storehouses, etc. Less elementary needs are met by private donations, and in order to correlate and control such various gifts to the nation, and to advise and aid the several committees in charge of them, the Secretary of War formed a Commission on Training Camp Activities, made up of non-military men, whose duty it is to keep in close touch with the Army and with the thirty-two or more camps and cantonments. The board is composed of nine members, with Mr. Raymond B. Fosdick as chairman. Under its general direction are the military branches of the Y. M. C. A., the Knights of Columbus, the Liberty Theaters, the Camp Libraries, Jewish Welfare Board, and many other sub-organizations, each with its own management, each providing its own funds, and each erecting its own buildings.

Interior of Library at Camp Devens, Mass.



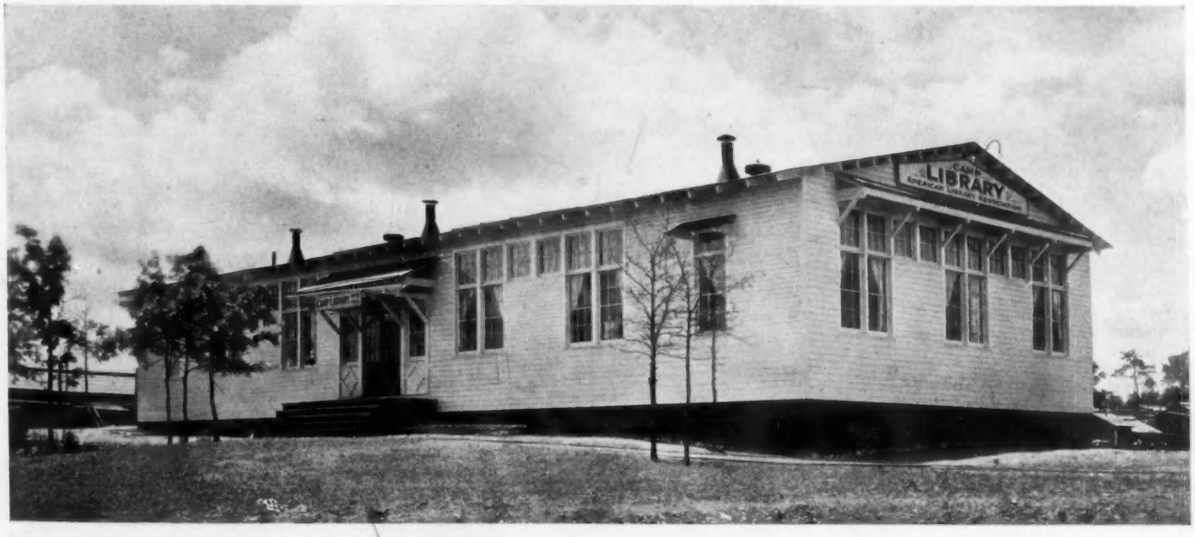
Floor Plan of Typical Library

The Commission requested the American Library Association at its general convention at Louisville, Ky., a year ago, to furnish libraries and books for the soldiers, and the meeting asked Mr. Edward L. Tilton of New York to act as architect for the buildings as his contribution to the war work.

As an architectural problem, there were three requirements:

First. A suitable space was to be enclosed with the least possible expense, and this Mr. Tilton accomplished by following the construction of the other cantonment buildings, making only such modifications as were needed to correct defects.

Second. The building was to conform to the type generally acknowledged as best for the small library



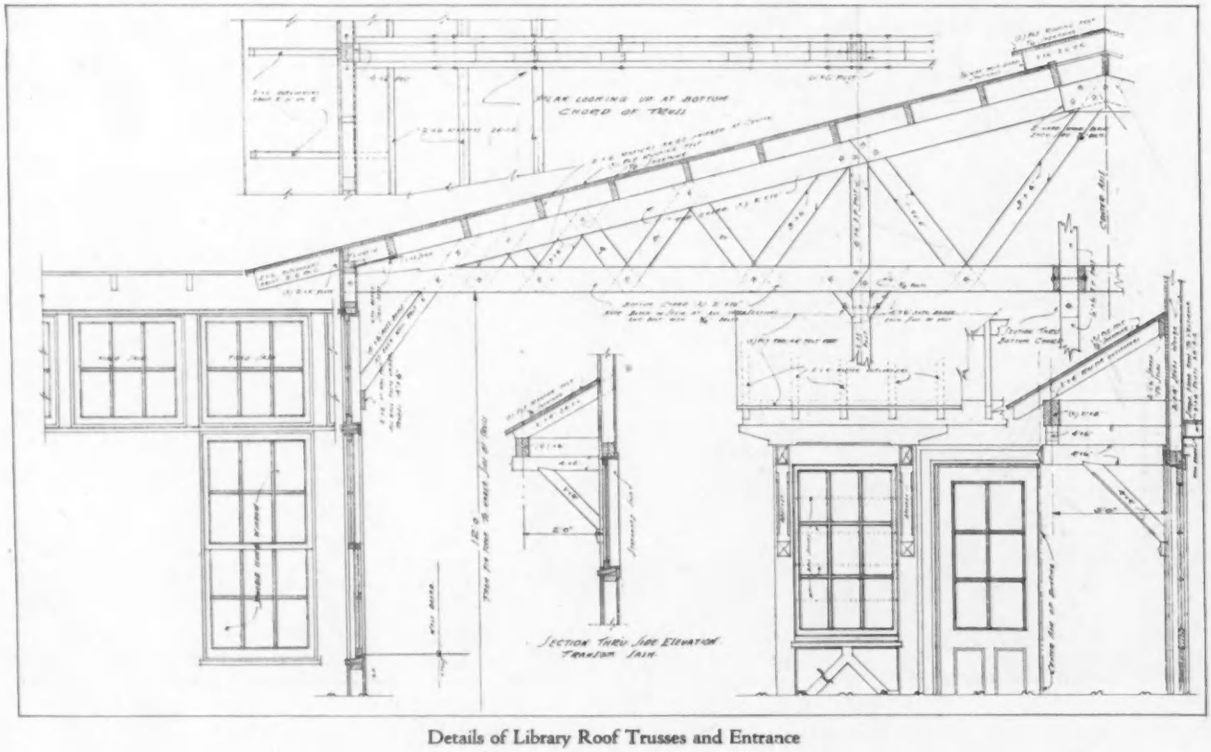
Exterior of Library at Camp Devens, Mass.
Edward L. Tilton, Architect

Interior of Library at Camp Grant, Ill.

which is operated under one general supervision.

Third. Was the self-imposed task of designing a building that would look as well as it was possible to make it without violating the first and second requirements.

The general outline of the structure was fixed and could not be modified, and perhaps the finished building is all the better for it, since it harmonizes with the barracks around it, having the same slope and color of roofs, similar cornice detail and projection, and the same general scale of parts. One thing the architect could do was to group the win-



Details of Library Roof Trusses and Entrance

dows so they composed; another was to elaborate the doorway-shelter, for cost was not quite so restricted as in the War Department's buildings. He was able to paint the libraries outside, — an obvious advantage, — for the siding available was of the common grade of North Carolina pine and turned dirty in weathering, with black smears and streaks. In this again the libraries tone in with the other buildings, as the paint selected was of a pale tan color not altogether different from the better portions of the natural wood. About the doorways and cornices, however, he was free to use vivid colors, and a palette was selected suggestive of the early Greek and other primitive polychrome decoration; first, a darker tan than the walls, or a "stone color," as the material men call it, similar to the light grayish brown called "buff" in the uniforms of George Washington's army; next, pure black; lastly, the strong red iron oxide, called, technically, "Venetian red." The red was used on the window sash, and red or black interspersed at the ends of cornice rafters; the posts, beams, and outlookers at the entrance doors were painted red, buff, and black — a small but vivid mass of strong color, bold and effective.

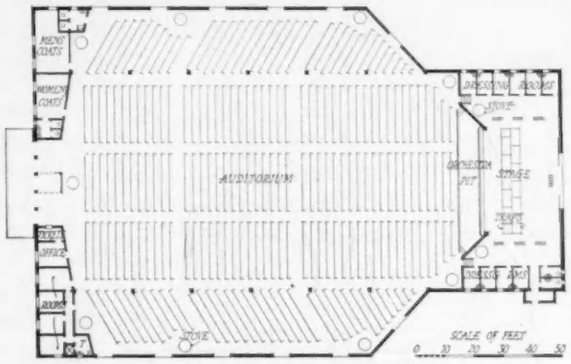
The libraries consist in the main of a single room surrounded by windows, with two rows of square posts the entire length. The delivery desk is in the center and every one must pass close to it, entering by the right and leaving by the left, all under control of a single librarian or his assistant; an office is behind the desk, separated from the readers' space by low bookcases. There are thus two groups of readers, — one to the right and one to the left, with the books on accessible shelving around the walls or in short projecting cases. The disposition of the several classes of books is left to the individual librarians. They, with their assistants, sleep in the buildings; their quarters are at one end.

The type-plan is modified in several cases, depending on climatic conditions, the local cost of construction, or special requirements. At Camp Devens the plan is T-shaped with space for three groups of readers instead of two; at Camp Upton there is an ingle and open fireplace at one end; in several Southwestern camps there are pergolas or covered porches along the front.

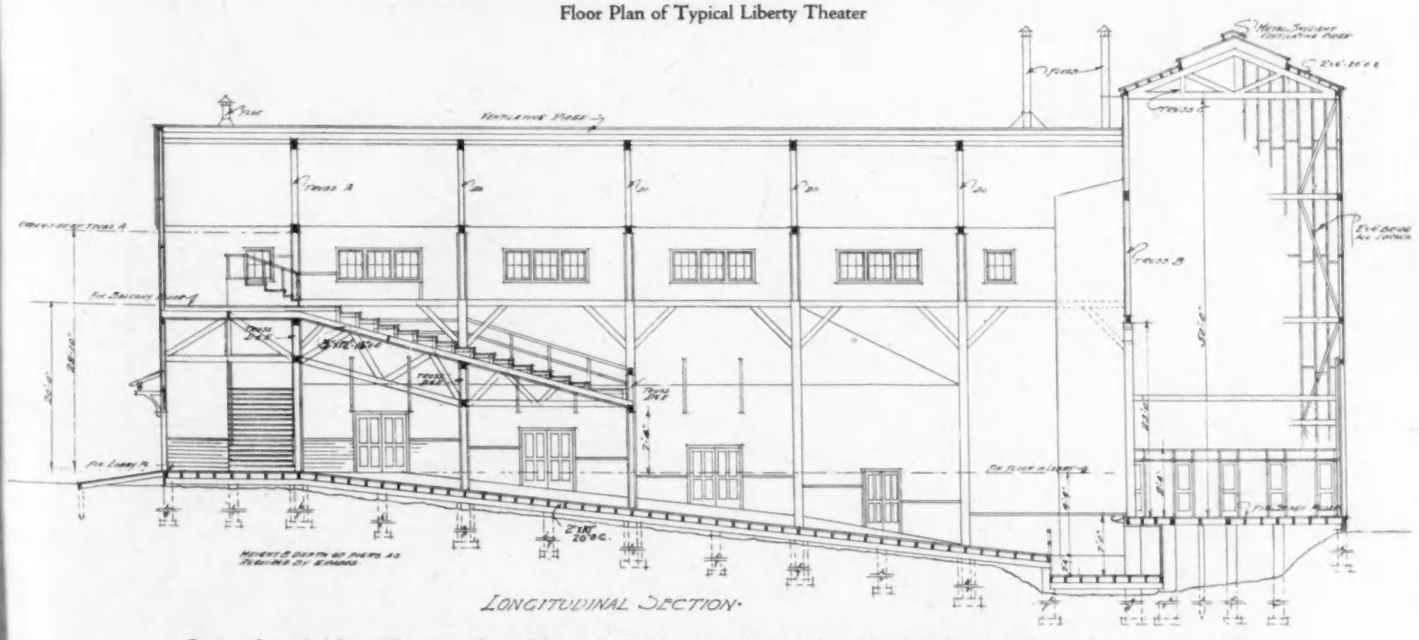
In general, the walls are wainscoted on the inside with smoothed sheathing to window-sill height and pulp board above, which in the Northern buildings continues as a ceiling against the rafters to insulate from the cold. In winter the ridge-ventilators are closed by boards nailed on the outside.

The heating is by large, regulation, upright stoves, except in one or two cases, where steam heat is used, but this is too expensive for general adoption.

THE LIBERTY THEATERS. The libraries had proved so successful that the



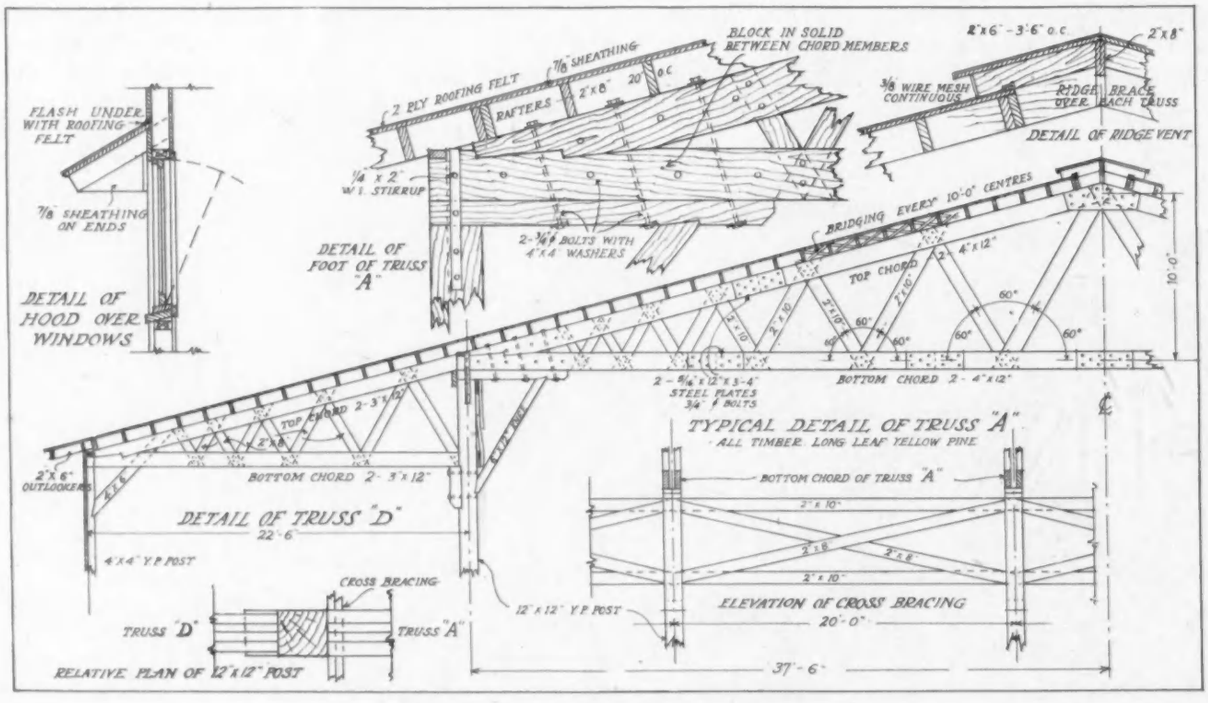
Floor Plan of Typical Liberty Theater



Section through Liberty Theater at Camp Merritt, N. J., Showing Balcony and Fitting of Auditorium Floor to Natural Slope of Site

Exterior of Liberty Theater at Camp Devens, Mass.

Commission on Training Camp Activities asked a further contribution of Mr. Tilton's services. Theaters were to be constructed in all the camps to house the small plays, vaudeville, and concerts, in which many of the best actors and singers were to appear as their contribution to the war work. Again the problem was to enclose the greatest space at the least possible cost, with the least possible obstruction to sight and sound. A rather elaborate though not a large stage was needed, with space for drop-curtains, flys, dressing rooms, and other paraphernalia. Considerable strength was necessary, and this brought out an amusing difference of opinion among the constructing quartermasters and their engineers. Mr. Tilton adopted the unit strengths and live loads allowed by the New York Building Code for his basis of calculation; yet there were several protests from the quartermasters — some that construction was unnecessarily heavy, and others that it was too light. In one morning's mail he received two letters from camps in different parts of the country, the first requesting that the



Typical Details of Roof Trusses in Liberty Theaters
Edward L. Tilton, Architect

main tier of floor beams be made heavier as the floor was unsafe, the other that the same tier in identically the same plan be made lighter as it was wasteful!

With one exception the theaters are without gallery and seat 2,700 persons. They are 170 feet long from entrance doors to drop curtain. Acoustically, they have proved excellent. Echoes are broken by the roof trusses and braces, and the wooden construction assures a resonance that carries the voice clearly to portions most remote.

There is no attempt at decoration, either inside or out. The siding and door-shelters are unpainted. Inside, the posts are smoothed, but braces, roof-construction, and the under side of roof sheathings are left rough. Heating is accomplished by the usual cantonment type of stoves with the long stove pipes left exposed for radiation; in some cases steam plants have been installed. Fresh air enters by the windows, and the exhaust is through sheet-iron ventilators in the roof, — a gravity system entirely. The whole building is a purely utilitarian machine, efficient though hardly beautiful.

Cost of Construction. In this connection it might be interesting to outline briefly the financial relations between the War Department and the builders for all cantonment work. The building enterprise was so vast that lump-sum contracts were impracticable; no builder could tell what he would have to pay for lumber, or when he could get it, the drain on the yards was so great. Without some sort of Government control, wages might rise unreasonably. Estimates would necessarily have been high enough to protect the contractors against unforeseen advances; but if the advances exceeded even such an allowance it would mean failure of the contractor and a consequent expense and delay, or a reletting of the balance of the contract, possibly necessitating the paying for much of the work a second time; but if, on the other hand, the unforeseen advances did not materialize, the profits of the contractors would have been enormous. In other words, it would have been a gamble for the contractors, entailing either liquidation or excessive profits, and the Government would lose either way.

So the work was done on cost plus percentage, with various unit prices and safeguards. The War Department selected the contractors and prepared and furnished the plans.

Material was to be bought in the open market at the lowest prices obtainable, but each bill had to be approved as reasonable by the constructing quartermaster of the camp in question.

The wage-scale for all trades and labor was to correspond to the Union rates prevailing just before the outbreak of the war, with double time paid for Saturday afternoon, Sunday, or overtime work. A week's work, therefore, consisted of 44 hours at full time, with each hour over at double time. Many of the carpenters worked 12 hours a day right through the week, or 84 hours, and their rate (near New York, at least) being about 70 cents per hour, this meant $30.80 for the first 44 hours, and $56.00 for the remainder, amounting to a total of $86.80 for a week's work. According to the rules laid down, it was fairly earned. The tales of the Government being robbed were not justified if the regular Union wage scale be accepted as proper.

There were to be thirty-three libraries. The donor of one desired to remain anonymous, the others were to be built from a gift of $320,000 contributed by the Carnegie Trust Fund. They accordingly averaged $10,000, but that at Camp Gordon in Georgia cost only $5,809, while that at Camp Lee in Virginia cost $9,531; yet they were both of the longer 120-foot type and of exactly the same design. The theaters similarly ranged in cost from $27,000 to $42,000.

Such a variation in price shows the futility of attempting to tell the cost of a building before estimates are received, for here is a variation of over 50 per cent on exactly the same plans and details. The much ridiculed, cubic foot price seems as accurate a forecast as it is worthwhile to make. Computing this and starting from a base 2 feet below the floor levels, the libraries varied from 6¼ cents to 10¼ cents, and the theaters from 5 to 7¼ cents.

Y. M. C. A. Quarters for American Officers in London

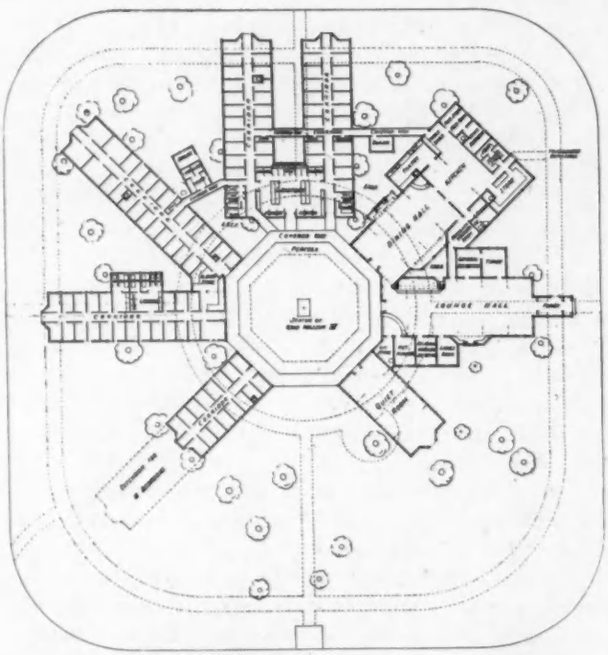
S. PHILLIP DALES, ARCHITECT

AMERICAN officers who arrive in London after a few months will find themselves able to be quartered in the heart of the fashionable club district. The American Y. M. C. A. has in process of erection commodious huts for American officers in St. James' Square. For many years a number of London's most exclusive clubs have been situated in this square, and many of the nobility have for a long time maintained imposing town residences there.

In order to gain permission to have the officers' huts erected there, the American Y. M. C. A. had to comply with certain wishes of the residents of the square. One was that no trees should be cut down or harmed. Another was that no flues be allowed, nor smoke of any kind. Nothing daunted by these stipulations, the committee in charge of the huts said they would comply with these demands and proceeded with the plans.

The architect, S. Phillip Dales, has shown great ingenuity in arranging the huts to avoid the numerous trees. Only in one or two instances did he find it necessary to have a tree project through the building, and even here his plans were arranged so that the tree "grew up" very near to the wall. In such cases an open space has been left about the tree with a cement wall enclosing it. Water pipes have been inserted within this space so that the tree will be well watered and aired at all times.

The huts are arranged in an original manner as shown in the plan, spreading out in eight different wings from a circle, in the center of which is a statue of King William III which was erected in St. James' Square some time ago. The statue will serve as the feature of a central garden which will be planted in the Dutch style.



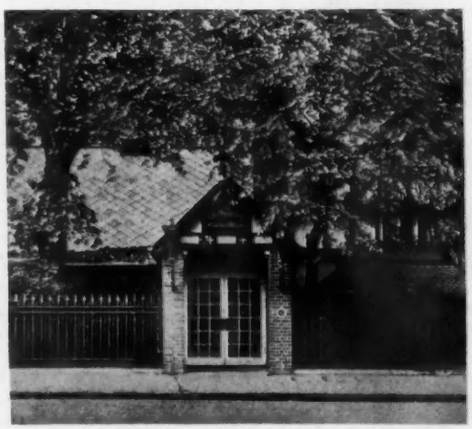
Floor Plan of American Officers' Club, London, England

The style of architecture is Elizabethan. The architect had two reasons for his choice of style. One was the very practical reason that this type of architecture fitted in best with the available building material at the present time. The walls are brick. The roof is covered with diagonally laid gray asbestos cement tiles. There are many timbered gables in evidence and the chimneys are of the well known diagonal type, giving an essentially striking Old English note. But, besides the practical purpose which the Elizabethan style has served, a nice idea has been carried out in that the sons of the descendants of Old England who find themselves here can feel surrounded by a modern edition of the architecture which was in vogue when their pioneer forefathers went out to colonize America.

The main entrance of the huts opens on to Charles street, which gives quick access to Haymarket. After entering a small hallway, one proceeds to the large lounging hall, 60 by 30 feet in extent. This has been planned primarily for comfort, and there are many cozy corners and ingle nooks about. On either side of this hall are the offices of the hut manager, department secretary, and the retiring room for the lady workers. The reverse end of the lounging hall gives access to a wide, central veranda. On the quietest corner of the square will be a room for reading, writing, and resting.

In another wing is a large dining hall, kitchen, pantry, and so forth. The remaining wings are for sleeping quarters, where 110 men can be accommodated. All the rooms are single and many shower baths have been planned for.

The illustrations at the bottom of the page show the huts of the English officers in Eaton Square, London, which are similar in exterior treatment to the American huts now under construction.



Views of Queen Mary's Club for British Officers, Eaton Square, London. Similar in Design and Arrangement to American Officers' Club in St. James' Square

The Development of American Architecture

III. ECLECTICISM AND FUNCTIONALISM

By FISKE KIMBALL

IN America, where there were so few trained architects or accessible models, the supplanting of traditional knowledge of forms by unrestrained eclecticism had even more disastrous results for the common run of buildings than it had in Europe. The Civil War (1861–65), with the materialism of the resulting era of economic reconstruction, accentuated the difficulty and subjected government architecture to a mechanical system. Nevertheless there was no period of years in which competent and thoughtful men did not seek to uphold the ideals of their art in buildings which worthily represented contemporary movements in Europe. Most notable of this group of men was Richard Morris Hunt (1828–95), the first American to study at the École des Beaux-Arts in Paris, who brought with him to New York in 1855 the rationalistic training of the school and a preference for French Renaissance forms, then dominant under the Second Empire. In the Lenox Library, New York (1870–77), he followed the tendencies of Labrouste; while in the houses for the Vanderbilts in New York and at Biltmore, in the Astor residence, and in "cottages" at Newport he exploited every phase of his favorite style, only adopting a more classical tendency in the last years of his life under the influence of younger men. The older architects of English training, meanwhile, were attempting to establish the supremacy of Victorian Gothic, and in churches, at least, medieval forms were employed as a matter of course.

Trinity Church, Boston, 1872–77
H. H. Richardson, Architect

When Henry Hobson Richardson, another American of French academic training, chose the Romanesque style for his accepted project for Trinity Church in Boston (1872), he was influenced primarily by the slight depth of the site, which was unfavorable to a Gothic nave. He clothed the broad cruciform naves and great central tower with a rugged mantle of polychrome sandstone reminiscent of Auvergne and Salamanca. By the time the building was completed in 1877, however, he saw in Romanesque forms a far-reaching adaptability to American needs, which would permit the development of a truly national style. Their simplicity and ruggedness seemed suited alike to materials readily available, to the general limitation of funds, and to the relative lack of skilled carvers. In subsequent buildings, like the Allegheny Court House at Pittsburgh (1884), he expressed freely, with a personal vocabulary of Romanesque elements, the ideal character and practical conditions of a great number of contemporary types, — the town library, the country railroad station, even the vast warehouse. Richardson's mannerisms, however, such as the fondness for towers and for broad, low arches, were more easily acquired by others than his power of picturesque yet logical composition. Thus, after his untimely death in 1886, his style was quickly discredited by imitators, while the abler architects continued their independent development.

Simultaneously with the building of Trinity had come the founding of the Queen Anne movement in England, with its wide program of frankness and colloquialism, and the revelation of foreign arts and crafts to America through the Centennial Exposition in 1876. These inspired many attempts at imitation, and some free and original creations, such as the Casino at Newport, built in 1881 by the firm of McKim, Mead & White. The attention of these men and some others, hitherto attracted by the French Renaissance or the Romanesque, was naturally drawn to the American buildings of the seventeenth and eighteenth centuries, which correspond to the prototypes of the Queen Anne style abroad. Thus began a direct revival of Colonial architecture, in many houses of the eighties, with a richness of delicate detail on the exterior very different, to be sure, from the general simplicity of the old examples.

It was this adaptation of native Renaissance forms which prepared McKim, Mead & White for the adoption of those of the Italian Renaissance. These were employed for the first time by one of their associates, Holden Wells, in the Villard houses in New York (1885), where the arched windows of the Cancelleria furnished the motive. The decisive work,

Boston Public Library, 1888–95
McKim, Mead & White, Architects

however, was the Boston Public Library (1888–95), in which McKim, taking his departure from the Bibliothèque St. Geneviève, gave the scheme the warmer and more robust character of Alberti's San Francesco at Rimini. In the interior each element of the building was sympathetically studied from Italian examples, which showed the structural use of classical elements, and executed with a characteristic treatment of each material and a harmony of decoration hitherto unknown in America. McKim's purism of detail in the library was complemented by the luxurious elaboration of Renaissance ornament by White and Wells in the Century Club and Madison Square Garden in New York (1891). The effect on current practice was electrical. Almost overnight Romanesque and Queen Anne gave way to Renaissance forms, which more nearly approached universal acceptance than those of any style since the Greek revival. There were variants, to be sure, fresh arrivals from the École des Beaux-Arts tended to follow French Renaissance and academic architecture rather than Italian. For domestic houses many preferred more literal imitations of the Georgian buildings of the colonies in the eighteenth century. The Italian tendency received a powerful reinforcement, however, in the work of Charles A. Platt, who introduced the Italian formal garden in America, and has steadily widened the scope of his architectural activity without departing far from his favorite style. It still counts many adherents.

The crucial test between the partisans of a free and modern interpretation of motives chiefly medieval, and the partisans of a strict following of some form of classic architecture, came in the buildings of the Columbian Exposition in Chicago in 1893. The studies of John W. Root, the original consulting architect of the exposition, were of a free, semi-Romanesque character, with some recognition of the steel construction and the temporary nature of the buildings. These conceptions might well have dominated the *ensemble* had not the death of Root on the eve of the undertaking left the group of eastern architects, headed by Hunt, to whom he had confided the buildings of the Court of Honor, free to carry out their own ideas. These were that the mutual dependence of their buildings, and the formal character of the court, demanded a consistent style of generally Roman classical character, with a uniform cornice height, fixed at 60 feet. This did not preclude a treatment of merely academic cast, with details tinged by Italian or Spanish influence, so that within the classical scheme there was a considerable diversity of style. The buildings which attracted the most admiration, however, were those in which the main cornice was reached by a single order of strictly Roman character, namely, the Agricultural Building by McKim, the Fine Arts group and the Colonnade toward the lake, both by Charles B. Atwood. Atwood, in the Fine Arts Building, followed Besnard's project for the *Grand Prix de Rome*, with its central portico with an attic and a saucer dome behind; McKim was also greatly influenced by the same design, although he followed it much less closely. True to the hopes of their designers, the classical buildings produced a cumulative effect of harmony and magnificence which was deeply stamped on the memory of the whole nation.

Although the leading architects of the exposition had hoped to give a striking object-lesson of the value of classical and academic formulæ, they hardly expected the result which ensued. Whereas, earlier, there had been one or two isolated experiments with

Garden of Maxwell Court
Charles A. Platt, Architect

strictly classical forms, such as the Grant Mausoleum in New York (1891), the whole public architecture of the country was turned now into a monumental and classical channel. The firstfruit of the movement was McKim's unified classical design for Columbia University in New York, with its great domed library (1895). A fresh impulse came through the restoration of the University of Virginia by White after the fire of 1901, and the activity of McKim with D. H. Burnham, Olmsted, and St. Gaudens in the commission for the improvement of Washington.

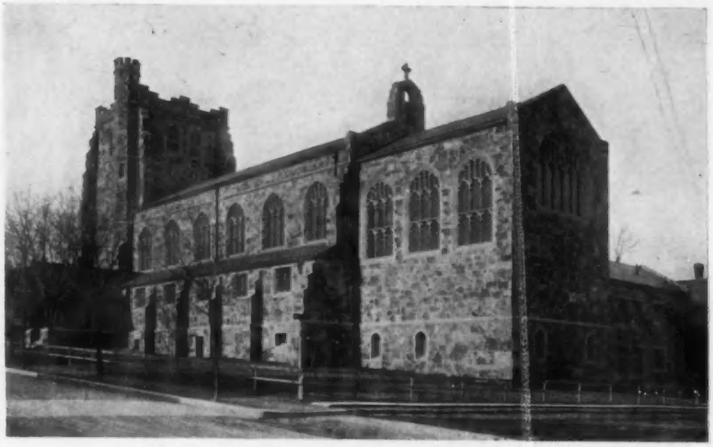
Pennsylvania Station, New York, 1910
McKim, Mead & White, Architects

The classical character of the early buildings of the Republic thus gave a nationalistic sanction to the classical tendency, and the style of new government buildings was henceforth established. Milestones in the progress of the movement were the Knickerbocker (Columbia) Trust Company in New York, with its single rich Corinthian order, including the whole height of the building, and the Pennsylvania Terminal Station, with its long Doric façades and its great hall. From the start the orders used frequently included Greek forms, and these have been copied increasingly. A notable recent instance is the Lincoln Memorial in Washington — a peristylar cella in which the old revivalist enthusiasm for an abstract architectonic ideal has prevailed over any suggestion of individual character. The current tendency to employ Adam or Louis XVI forms in residences and hotels shows the extension of the classical movement to fields where more monumental treatment would be out of place. This second classical revival in America, it must be recognized, has little contemporary parallel abroad except in England, which has itself been influenced in the matter by developments on this side of the ocean. While the rest of the world is seeking, in one way or another, new forms expressive of the novel elements of modern life, this insistence on the traditional authority of the past can be adequately explained only by the unparalleled heritage of classical monuments from the formative period of the nation. Thus the founders of the Republic might seem for the moment to have achieved their aim of establishing classical architecture as a permanent national style.

In spite of the overwhelming victory of classical forms the Gothic tendency has been kept alive, — largely through the enthusiasm and artistry of two men, — Ralph Adams Cram and Bertram Grosvenor Goodhue. Their initial success was the Church of All Saints, Ashmont, Mass. (1892), which embodied the same free tendencies as the designs of Sedding in England. These tendencies, on the whole, have been perpetuated in their later work, such as the chapel and other buildings of the Military Academy at West Point, so picturesque in adaptation to the rugged site. Mr. Cram has tended to follow precedents more strictly than Mr. Goodhue, however, and to range more widely among the medieval styles, as in his "Early English" Calvary Church at Pittsburgh and the late Byzantine Administration Building for the Rice Institute at Houston, Tex. Even in its last strongholds, ecclesiastical and collegiate architecture, the Gothic has had to yield ground, especially to the Colonial revival. Nevertheless, although both the Protestant sects and the Roman Catholic church now prefer the styles unequivocally associated with their own past, the preference of the Anglican episcopate for Gothic forms, and the personal prestige and ability of the Gothic leaders, have still maintained the Gothic tendency.

Columbia University Library, New York, 1895
McKim, Mead & White, Architects

The striving for characteristic expression, which is the principle of functionalism in architecture, appeared subordinately — in America as in Europe — in all the movements of the nineteenth century. Structural purism was a quality of Latrobe's designs, as it also was, more pronouncedly, of those of the Gothicists. The lessons of Ruskin and Viollet-le-Duc were not forgotten in the early years of the Renaissance revival and of neo-classicism, when it was felt that the column must be used only in its original function of an isolated support. Even in the latter years of these movements, when structural purism has yielded to the expression of monumental character, this very character itself is felt to be but one of a number of ideals which govern the different phases of architecture, — civic, religious, and domestic. Moreover, in spite of eclectic inclination — so strong in America, especially in McKim's work — to model the exterior of a building on an individual prototype selected in advance, there has been a steady development of logical planning and expression of plan,



All Saints Church, Ashmont, Mass., 1892
Cram, Wentworth & Goodhue, Architects

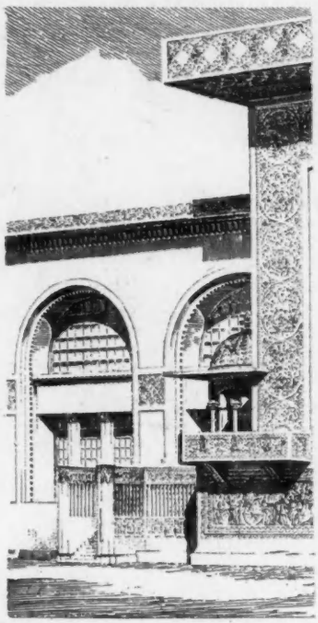
Woolworth Building, New York, 1911–13
Cass Gilbert, Architect
Gothic forms chosen as clothing for vertical supports

under the leadership of the Beaux-Arts men. McKim, Mead & White themselves, moreover, were the pioneers in a characteristic use of materials which has produced such interesting results as texture, brickwork, the modeled and polychrome terra cotta, and the local, ledge-stone revival of Philadelphia.

In the expression of structure a new problem has been presented by the steel frame building. The absence of legal restriction permitted real estate owners in the crowded districts of New York and Chicago, about 1889, to increase the number of stories in new office buildings by supporting the floors entirely on iron or steel columns, leaving the wall with only its own weight to carry. The development of elevators made the upper stories as desirable as the lower ones, and made possible "skyscrapers," like the World Building in New York, with a height of 375 feet. Here, however, the self-supporting walls reached a thickness of 9 feet at the base and injured the value of the lower stories. It soon occurred to the designers that the wall itself might be supported on the steel frame at intervals and be reduced to a mere veneer, with great resulting economy. Thus buildings of twelve to twenty stories have become commonplace in every considerable city, and such extreme heights as that of the Woolworth Building in New York (779 feet) have been reached. The retention of a shell of masonry, which differentiates these buildings from the steel and glass shop fronts abroad, was originally due to a natural adherence to tradition. It has been perpetuated for a far more vital reason — the extreme necessity of rendering such tall buildings secure against fire, before which exposed steelwork has proved to twist and bend with disastrous results. The only adequate protection has proved to be that furnished by casing all the structural members in masonry, preferably brick or terra cotta, which had already been through fire. Aided by experience in the great conflagrations in Baltimore (1904) and San Francisco

(1906), the technique of fireproof construction has developed so that the practical advantages of the system have led to world-wide adoption of many of its features. Its employment in façades, however, involves a new and delicate problem of expression.

A visual indication that the masonry was no longer self-supporting, but depended on the steel frame, was achieved about 1895 by Louis Sullivan, notably in the Wainwright Building in St. Louis and the Guaranty (Prudential) Building in Buffalo. He abandoned a wall surface of ashlar in favor of a simple casing of the members of the frame, with glass filling the whole of the space between. The greater weight carried by the vertical members he recognized by emphasizing the vertical lines. To avoid any structural suggestion in the casing, he used terra cotta having a delicate surface pattern. The principle of his designs has been widely followed by architects of tall buildings, irrespective of the style employed, although few have carried it through with such logical completeness. To Cass Gilbert the emphasis on the vertical lines suggested the employment of Gothic forms, which the éclat of his employment of them in the Woolworth Building has popularized to some extent.



Detail of the Transportation Building, Chicago Exposition, 1893

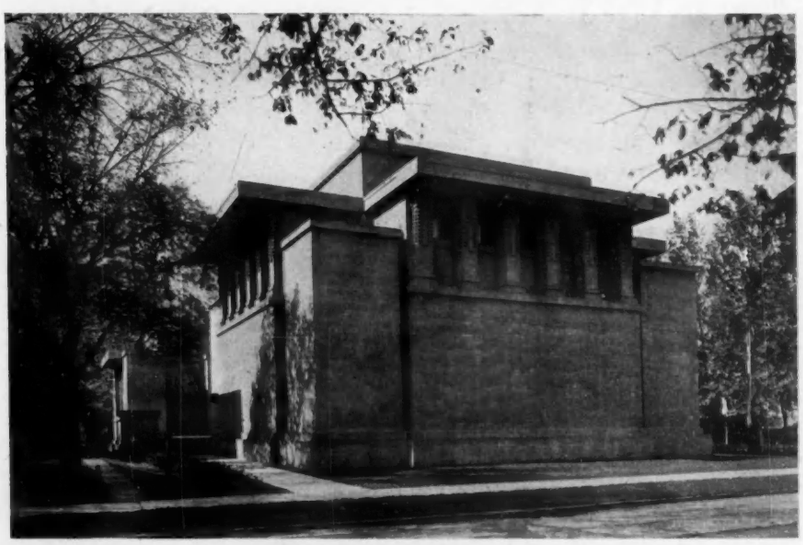
Louis H. Sullivan, Architect

A pioneer example of functionalist detail in America

America, with its freedom from the restraint of tradition, was also naturally one of the first countries to experiment with novel forms, consciously preferred to those of the past as expressive of modernity. The old desire for an "American style" could not be satisfied merely by the general adoption of any group of historic forms, even if, as in the case of Richardsonian Romanesque, its adoption was purely an American movement. In Richardson's work itself there was, as we have noted, a strong tendency to modification and originality of detail, and this tendency was taken up with special aptitude by Harvey Ellis, Root, and others in the Middle West. The manifesto of a truly independent progressive tendency was the Transportation Building of the Chicago Exposition by Louis Sullivan (1893), contemporary with the earliest similar attempts abroad. In spite of the overpowering influence of the classical *ensemble* of the exposition on America at large, this building made some converts, chiefly in Chicago itself. Through Sullivan's pioneer expression of the veneered steel frame the movement had an influence far beyond its own circle of devotees.

That participation in the movement did not involve mere imitation of its leader was early established by one of Sullivan's pupils, Frank Lloyd Wright. In his designs for residences he has employed broad ramified plans, wide eaves, novel fenestration, and a harmonious use of abstract motives of ornament, which have a suggestion of the Japanese. More ambitious applications of similar forms have not been wanting. In the Midway Gardens in Chicago, Wright has embodied the spirit of gaiety in forms of exuberant yet delicate fantasy. In his Church of the Unity at Oak Park he has evolved a monumental and characteristic house of worship for disciples of modern rationalism. To the present time, however, the movement has received more appreciation abroad than at home.

(The essay of which this is the last instalment has now appeared in book form as the chapter on American Architecture in a new "History of Architecture," by Fiske Kimball and George H. Edgell, just published by Harper and Brothers.)



Unity Church, Oak Park, Ill.

Frank Lloyd Wright, Architect

Modernist forms employed in the solution of a church problem which itself presents many features of modernity

EDITORIAL COMMENT

THE steps toward a national organization to represent the entire building interests of the country which were mentioned in our previous issue as having been taken, were completed at a conference held at Atlantic City on July 15 and 16. This movement, which was started only a few weeks ago, has quickly resolved itself into a well rounded out organization, and if the present efficiency is carried to the consideration of the problems that will confront it, all connected with the building industry may well rejoice in a conviction that everything possible and practicable will be done to remove the doubts which have harassed the industry since our entrance into the war.

The organization will be permanent and known as the National Federation of Building Industries. Its objects are stated in the following declaration which was adopted enthusiastically:

The National Federation of Building Industries, representing an interest second only to agriculture in the numbers who live by it, pledges to those in authority all aid within the power of the industry to accomplish success in the war. We are glad to assume our share of the burdens of the war and cheerfully to sustain, in common with other industries, whatever sacrifices may be essential to its successful prosecution. The Executive Board of the federation shall endeavor to devise means whereby, with the approval of the Government, the resources of the building industry may be best marshaled for direct assistance to the Government in carrying out the war and for the indirect assistance through maintenance of national prosperity and through creation of values upon which the national credit may be enlarged.

This constitutes a platform which acted upon with good judgment will surely work to the great benefit of the country. First, the utmost service to the Government in the present emergency with cheerful sacrifice when necessary; and second, the promotion and maintenance of the industry as an economic factor in the prosperity of the people, are practical and moderate aims.

The building industry has already been of great service to the Government and is capable of still greater effort, for to date only certain units have been utilized; but with the aid of a national organization the resources of all may be coordinated and made available to the Government. Moreover, the decline in private building has been so great that many fields of service thereby released for the disposal of the Government have not been fully utilized and there is, as a consequence, a deficit of earnings which is now adversely affecting many connected with the industry. The figures given by Senator Calder at the Atlantic City conference, which he has also made known at Washington, in an attempt to dissuade the Treasury Department from placing undue difficulties in the way of financing building operations, afford a clear conception of the present condition. He stated that in 1915 the building operations of the country reached the enormous total of $1,800,000,000, and that outside of Government work the extent of this year's building will not reach $300,000,000. This shows a very large decrease in the business of an important industry which cannot be easily passed over as a necessary corollary of war. It is still more disastrous when it is known that city after city is in urgent need of buildings for their growing populations and expanding industries. It is bringing about conditions that cause rentals to be increased beyond the scope of working people — where there are living accommodations to be had at all — and that contributes in large measure to the unsteadiness of labor. The lack of living quarters has become so general that the problem has been taken up by the National Government and $110,000,000 already appropriated for housing to remedy the shortage; but it is even now evident that this sum is much less than will eventually be needed. Although the great part of this work would in any case have been required of the Government, much of the need could nevertheless have been met through private building had there been no discouragement against it, for even during the uncertain conditions of war, capital will generally be found to provide what is in demand.

The large employment of Government money for the erection of dwellings introduces a new element into the development of land, and while it is hoped that some arrangement of the disposal and terms of holding property developed in this way may be devised that will be an improvement over current real estate methods, there is at present no indication of any definite and uniform policy. With no disturbance to the prosecution of the war, and with positive benefit to the Government in its housing problem, the building of houses for working people therefore might well be permitted to continue in the usual manner.

The building industry has to look forward as well to the days of reconstruction that lie ahead. With the coming of peace and the resumption of commercial life with new vigor, demands will be made on the industry that will require its full resources. The achievements of the ante-war days will be surpassed, and to do this the many related arteries of the industry must be maintained and developed. Organization and coordination of effort is the only way in which this can be done, and the new National Federation of Building Industries holds the promise of effecting that desirable end.